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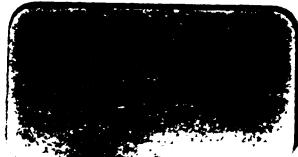
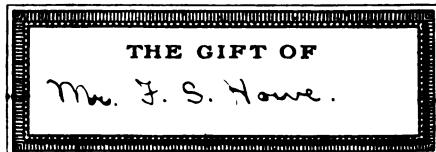
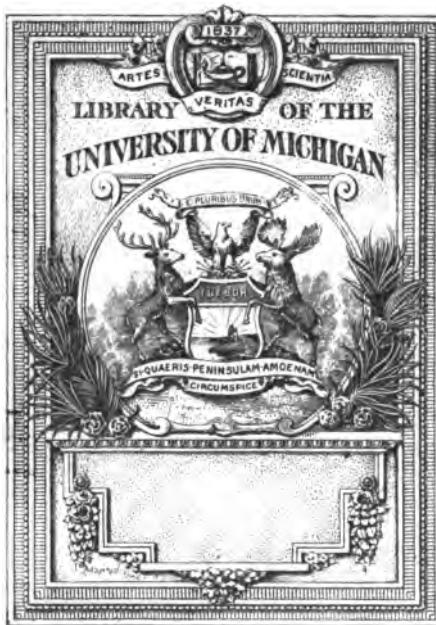
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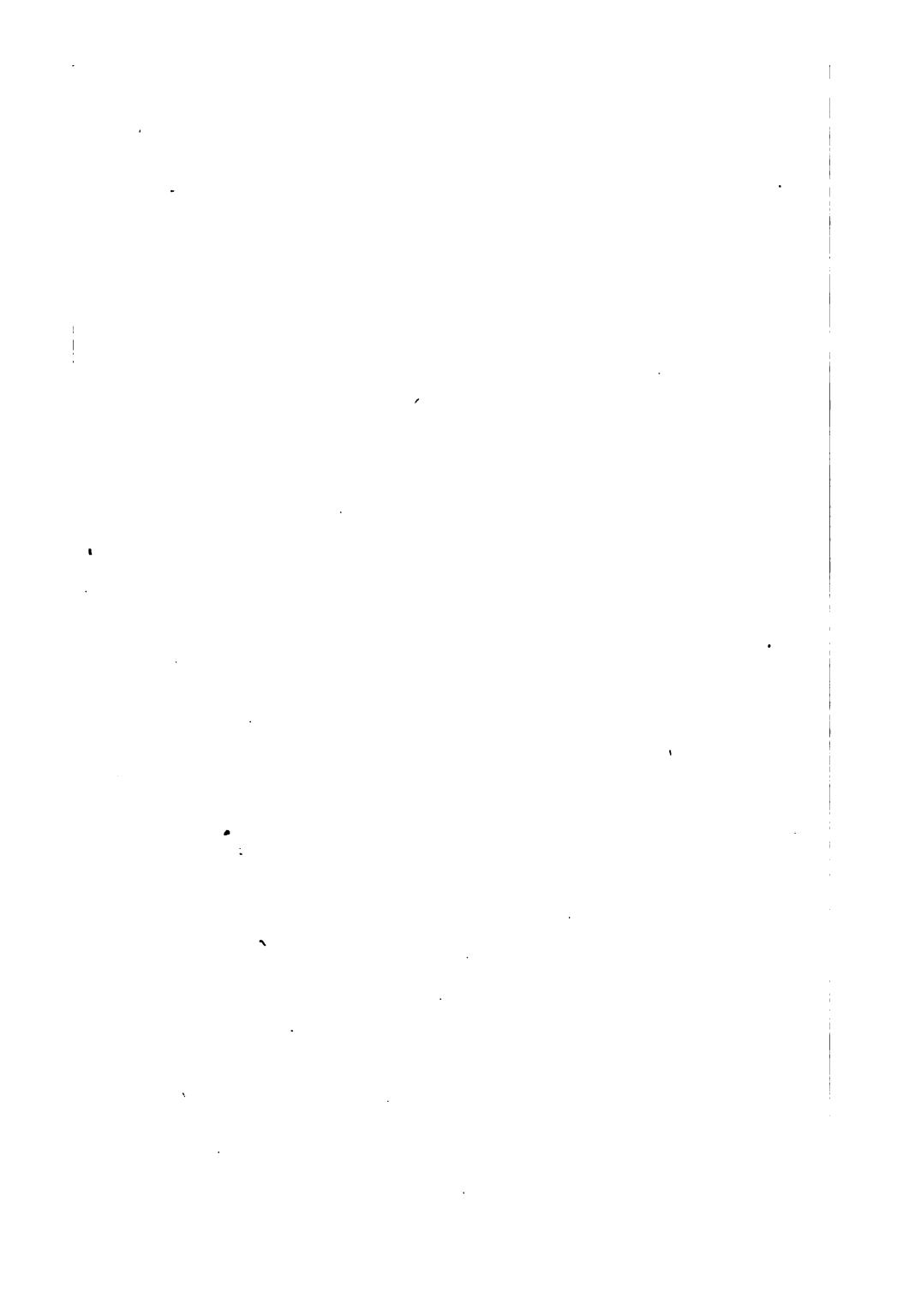
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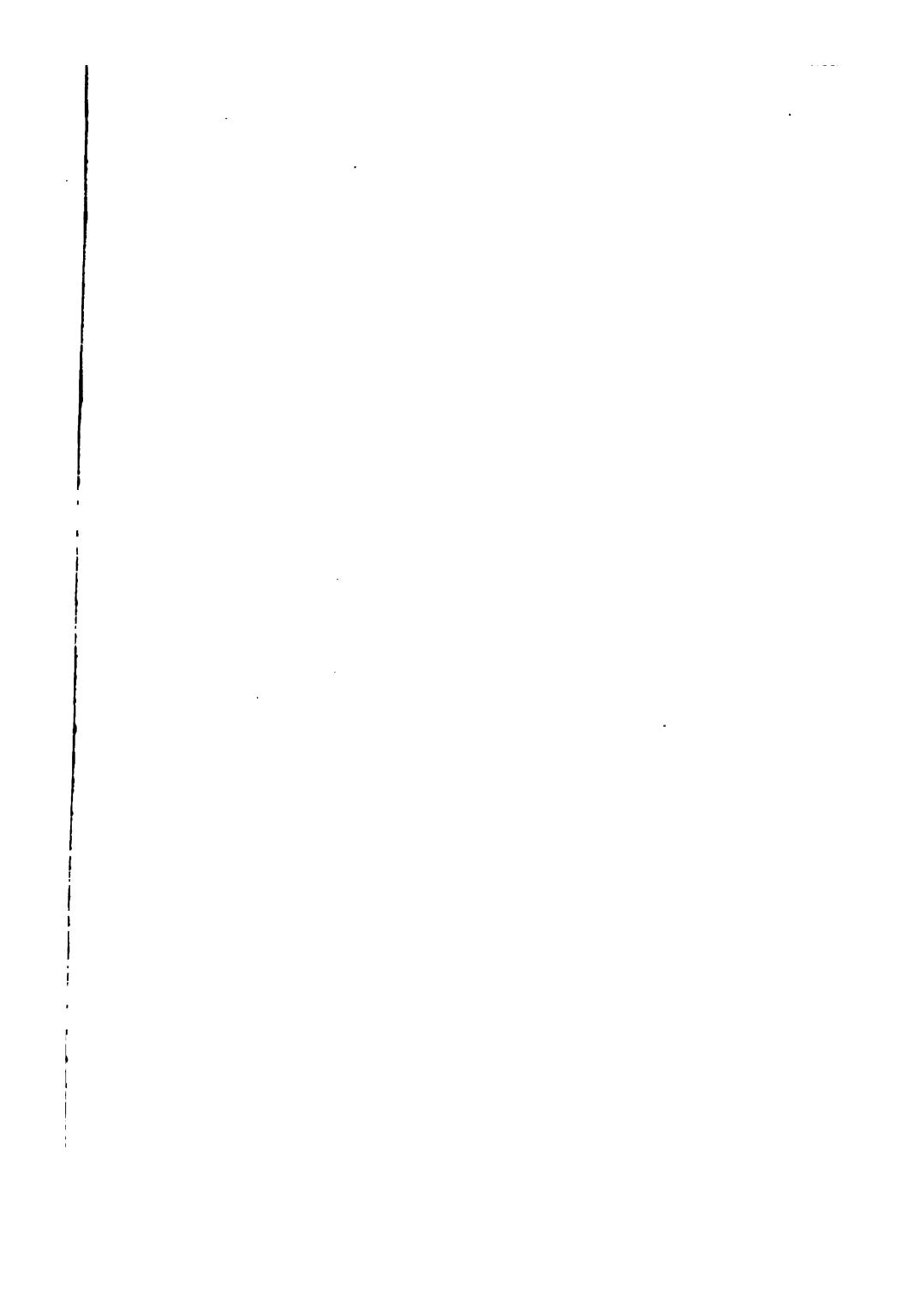
THE
ROMANCE OF EVOLUTION

JOHN C. KIMBALL



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THE ROMANCE OF
EVOLUTION
*AND ITS RELATION
TO RELIGION*

BY
JOHN C. KIMBALL
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John C. Kimball 4.10.1119. 12.3.59

PREFACE

The writer of these essays was a vigorous thinker and a man of conspicuous gifts of public speech. Through his love for natural beauty he was early led into scientific research and he made himself one of the most convincing of the interpreters of the philosophy of evolution. He combined a scientific habit of mind with a deep interest in spiritual realities. He was independent in judgment, sincere in utterance and vivid and picturesque in his capacity to translate truth into terms of life.

John C. Kimball was born at Ipswich, Mass., on the 23d of May, 1832. He graduated at Amherst College in 1854 and after teaching for several years entered the Harvard Divinity School where he graduated in 1859. From 1860 to 1871 he was the minister of the First Parish Church in Beverly, Mass., though during two of these years he served as chaplain of the Eighth Massachusetts Volunteers. For two years he did effective pioneer work on the Northwest coast, and then returned to New England to hold pastorates of five years at

Newport, R. I., ten years at Hartford, Conn., and four years at Sharon, Mass. In 1904 he built a house at Greenfield, Mass., where he made his home with his daughter and her family until his death on February 16, 1910.

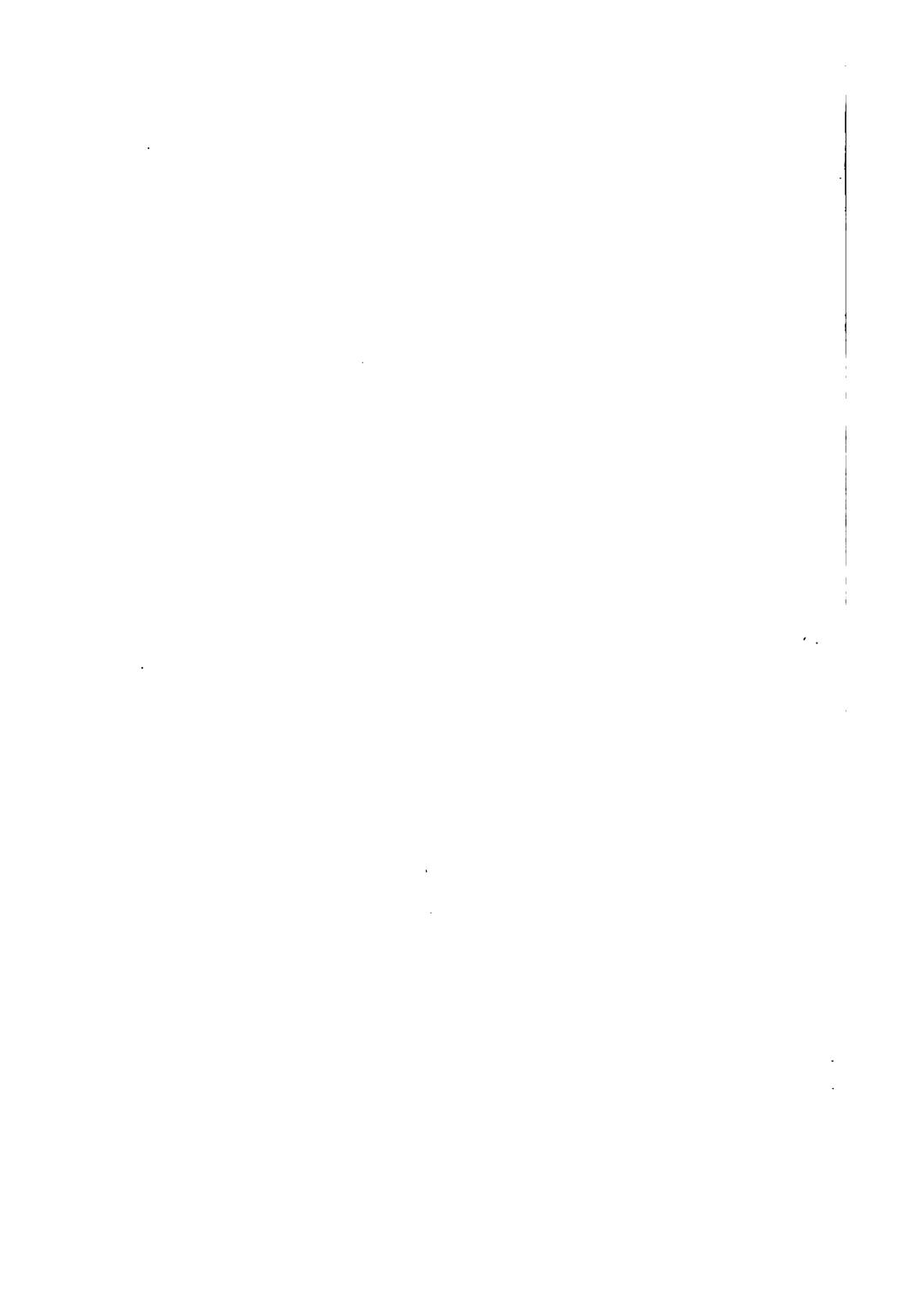
Mr. Kimball was a man of a wide range of reading, thorough, exact and untiring. He was sometimes truer to his convictions than to his convenience and preferred the approval of his own conscience to the applause of the multitude. He was accustomed to speak his mind with great freedom not only upon the philosophical and religious beliefs which he cherished, but also upon the vexing social problems of his generation. He was upright and downright, courageous and persistent. He was also remarkably productive, for in spite of his busy life of study and of pastoral service he wrote unceasingly upon the subjects and in behalf of the causes which enlisted his enthusiasm. A graphic article of his appeared in the Springfield *Republican* on the day before his death, and another in the *Christian Register* on the day after his death.

Many of the essays in this book were prepared for delivery as lectures before the Brooklyn Ethical Society and were also delivered at the Meadville Theological School and before various clubs and scientific societies in different

PREFACE

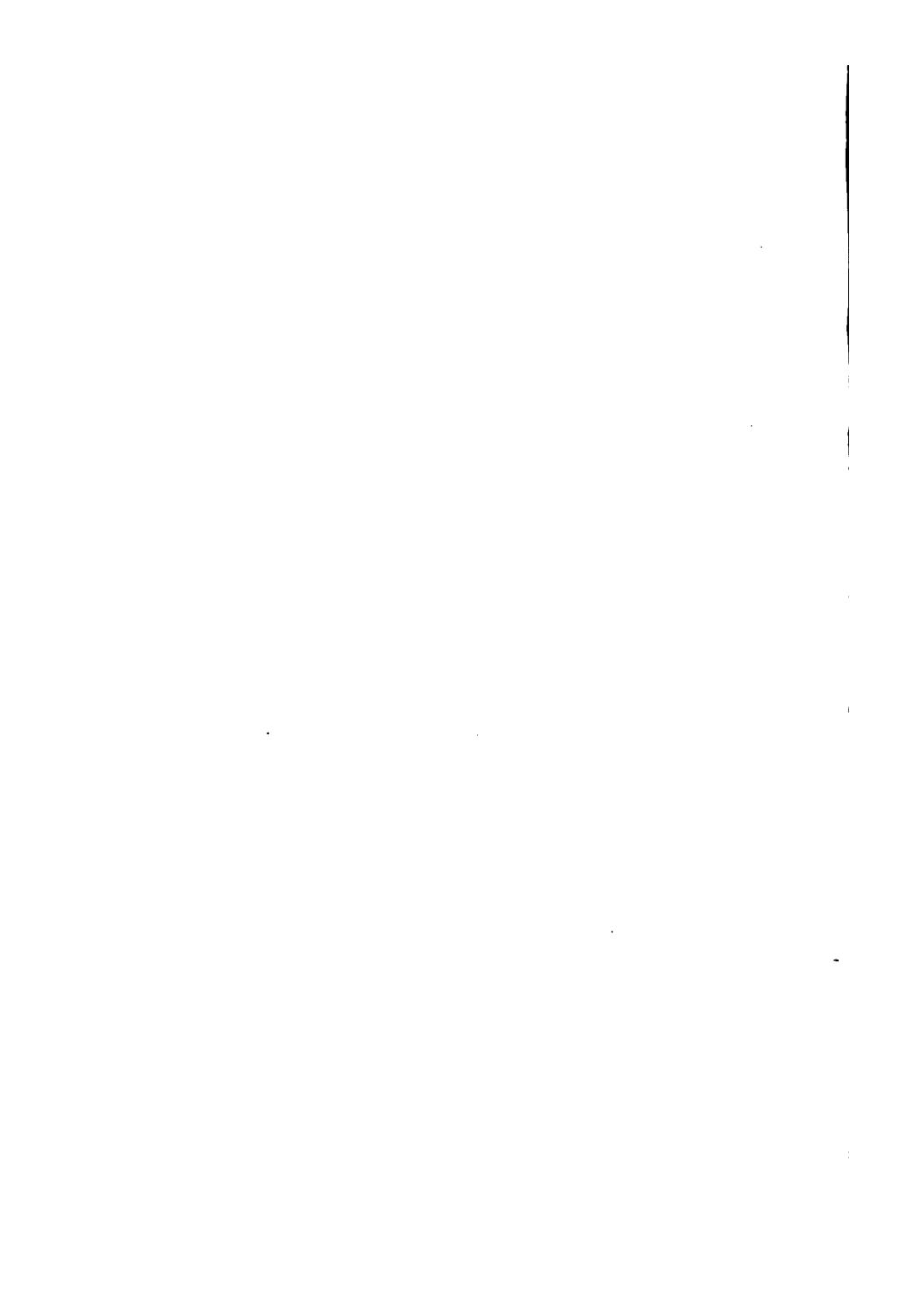
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parts of the country. Several of them were also probably used as sermons or may have grown out of sermons. They are remarkable for their combination of dramatic language with scientific accuracy, and for a certain pungency and persuasiveness of style which makes them real and lasting contributions to the literature which deals with the contacts of science and religion.



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THE ROMANCE OF EVOLUTION

I

THE ROMANCE OF SCIENTIFIC DISCOVERY

Poetry and physics, chivalry and chemistry, what concord could they have with each other? The minstrel's song and the laws of mathematics, how can a man serve them both? What possible sympathy can there be between the old world of fancy peopled with gods and fairies and full of mystery, and the new world of science inhabited, two-fifths, by Brown, Smith and Robinson, laid off in lots, lighted with gas and run through with railroads?

The first effect of scientific discovery was beyond question the destruction and dissipation of a great deal that was peculiar and beautiful in the old realms of poetry and romance. The elements lost their personality amid the fumes of the chemist's retort. Naiads and dryads fled away from the streams and the woods.

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The completed belt around the globe of geographical discovery left no room on its surface for Spencer's gorgeous Faerie Land. A hard, prosaic earth, destitute of all that could charm the fancy or feed the taste, was the early morning scene of the scientific day; and it is no wonder that under its influence philosophy and life became for awhile unromantic and material and that the soul should sometimes cry out for the warmth and grace of the old imaginations.

Nor is it to be denied that even now there are some aspects and associations of science in which it is difficult to find much that is pre-eminently romantic. The enthusiasm of the medical student inviting his lady-love to an elegant dissection will not compare artistically with that of the olden knight asking her to the cutting and slashing of a tournament. The chemical and physiological view of Amelia herself as composed of four simple elements, oxygen, hydrogen, carbon and nitrogen, mixed up with a few earths and salts, and arranged in two hundred and forty bones, seven hundred muscles and a variable amount of nerves and adipose tissue is beyond question less adapted to lyrical expression than the old conception of her as all purity and sweetness, warmed with love and set forth in lily cheeks and raven hair.

The teaching that poetry itself and all thought depend for their excellence on the amount of phosphorus secreted in the brain, and that the best way to get them is to eat plenty of eggs, cheese and fish, contrasts very badly from the romantic point of view with the classic image of the bard feeding on dew and dreams and pouring out verses from the creative impulse of his own soul. The elective affinities of acids and alkalies cannot be wrought into novels and poems by any known process of the art so effectively as the affinities of loving hearts. Then, too, the scientific way of selecting a wife and falling in love, going first to a phrenologist and getting a chart of her skull with all its bumps, combativeness, destructiveness and the like marked upon it, then to the physiologist to find out whether her temperament is biliary or phlegmatic, then to the family physician to make sure she is free from scrofula and consumption and then to the woman herself to exchange, not vows but charts and certificates, is not certainly on the face of it quite so romantic as where Arthur and Amelia fall in love with each other at first sight, and after the requisite number of haunted castles, diabolic rivals and cruel partings rush exactly at the end of the second volume ecstatic into each other's arms.

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This destructive and prosaic side of science, however, is only its beginning, only the clearing away of the old rubbish to lay the foundation of a nobler and fairer structure. Its first object is indeed truth, truth whatever the ugliness and humility of its outlines may be. But truth and beauty in their final result are always sure to blend together and always nourish and require in those who follow them to the end something at least of their own grand and heroic qualities. Truth here, the same as elsewhere, is found to be stranger than fiction, the world effect, however prosaic its surface may be, to have roots which go down to infinite depths of mystery. And scientific discovery dealing with these truths and facts has come already to a revelation, lit up the world too with a light, that for romance and wonder surpasses all that was ever seen or dreamed of in the grandest days of old.

Look, first, at the new realms it has opened before the astonished eye to be traveled through and explored. It would seem to the superficial glance as if the opportunity was about exhausted for the adventurer to go forth into regions strange and pastures new. The outside of the planet has been fully traveled over and explored. No *Nina*, *Pinta* and *Santa Maria* can sail forth to-day for new worlds

over untraversed seas; no Robinson Crusoe come to isles rising out of the deep that the foot of civilized man never has pressed; no new Hudson and Joliet and De Soto hope to find mighty rivers, lakes and bays all fresh to bear their names. And as we look over the map and see everything plain and clear, every nook and cape from the jungles of India to the wolf's long howl on Oonalaska's shore, we can but wish for new worlds to explore, wish we could stand again with the world-seeking Genoese as he set sail the first time for the wonderful West, climb with Balboa the steeps of Darien for the first glimpse of the mighty undreamed-of Pacific, follow Cook with only the through ticket of his own pluck in putting the girdle of a ship's wake around the mysterious globe and float with some new Joliet and La Salle down the Mississippi's ever ebbing tide,—wish that we had some fresh food for that hunger of adventure which gnaws forever in the human soul.

It is this very thing, however, that is being done for us on the grandest scale by natural science. This outer earth that was explored by voyagers and travelers of two centuries ago is only the binding and outer leaf of a vast volume thousands of pages thick and reaching back through myriads of years, every one of which is a realm with oceans and continents and

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a flora and fauna of its own waiting to be explored. Mighty streams of electricity, magnetism and light are flowing around us whose sources are as much a mystery as those of Egypt's great enigma for 3000 years, and with a tide that will take the voyager through realms that surpass in novelty anything which ever lay on the banks of the Amazon and Mississippi. The tiniest drop of water is shown under the microscope to be a globe crowded with strange forms of life, and, most likely, with its own capes and islands which no Magellan has yet circumnavigated or more than begun to explore. Marco Polo starting out on his travels through the strange countries and peoples of Asia had nothing before him which could rival what awaits the learner of natural history to-day in every grove and sod and fallen tree. What isles of fronded palm rising out of southern seas, what plumage of tropic birds and mysteries of leaf and flower unfolded to the first travelers in Yucatan and Brazil, what novelties of custom, dress and language in Abyssinia and far Timbuctoo and up the Indus and the Nile can surpass the combinations of that magic realm which opens upon us with ever more and more of wonder in the chemist's laboratory! And looking above, what is the whole earth, all its continents and isles

THE ROMANCE OF SCIENCE 7

and mountain peaks and glittering seas in comparison with those archipelagoes of light and piled-up shores of worlds which await the voyager across the ocean depths of space. It is said of a celebrated Hellenic scholar who spent his whole life in writing a treatise on the declension of the Greek noun that he regretted on his death-bed that he had tried in his studies to cover so much ground, remarking that if he should live his life over again, he should confine it wholly to the dative case. So with the realms of science. The fields, instead of being exhausted, are found continually to be but the doors into yet wider domains. We live still on the border-land of vast, mysterious worlds. Strange woods and fruits and bits of carving are drifting to our feet to-day from over the great sea of the unknown as they did to those of Columbus four centuries ago. Unseen barks fanned with the breath of mind are fitting out from a thousand little ports again to plow untraversed depths for other realms on the great globe of truth. New Balboas climb mountain chains still to behold vast Pacifics stretching farther on. Reports come to us every year of capes doubled in some far-off realm the human mind for ages had struggled with in vain. And as the first intimation which its discoverers had of America with all its vast-

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ness and wonder was a faint light glimmering out of the night shadows, so with each year's progress there sparkles some gleam of truth out of the darkness beyond, which is found ever and ever to be the herald of a new untrdden world.

Look, too, at the qualities of mind and character which are employed in carrying on this wonderful work. The stock picture of the natural philosopher as an ugly, dried-up old man gazing bewildered at the stars or stooping useless over a few withered leaves, and with no heart or imagination, nothing but the cold dry light of intellect, is the very opposite of what is true. Nearly all great discoveries have been made in the fire and freshness of youth or in the richness and strength of maturity. Newton was but twenty-five years old when the idea of gravity as the power which held the planets in their orbits first began to draw him into its great circle of truth. Laplace at the age of twenty-four had already won his place in the French Academy of Sciences. Leverrier's great discovery of Neptune, nothing less than giving to astronomy a new world, shed its luster on him at the age of thirty-five. Kepler at twenty-three had already begun that canvassing of the stars which made him at last the legislator of the skies; and Galileo was only

eighteen when he won his first laurels in that campaign, the brightest Italy ever saw, which ended with the conquest of half a dozen new kingdoms to the empire of truth.

The picking up of dry, dead facts is only the beginning of their work. Enthusiasm, love, gallantry, courage, imagination, not a few of the finest qualities which go to make up a manly and heroic character are brought to bear in carrying it on. No Red Cross knight in Spencer's Faerie Realm loving the holy Una, no army of Crusaders under Godfrey de Bouillon or Richard the Lionhearted, launching themselves out to rescue the Holy City from the hands of the Infidel, ever exhibited more heroism and devotion than those with which the picked army of scientific discoverers, age after age, have gone forth to the service of truth. They, too, have had their Holy City to be redeemed from the hands of ignorance and superstition. Out into unknown realms through toil, difficulty, want and darkness they have forced their way, past bodies of fact conscripted from every land; huge columns of figures trained with more than a soldier's skill, have been marshaled by them around its walls. Strange weapons out of the chemist's laboratory, vast batteries of the far-reaching telescope, all the subtle enginery of the cal-

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culus and the higher mathematics, have battered against its defenses. And then, perhaps, as it still held out, the scientific imagination, daring and dashing as the most romantic knight of chivalry's golden age, has sallied forth in some brilliant charge up to the gates and over all barriers, and been the first to raise the shout of victory. No workman who was a mere dry formalist and nothing else has ever succeeded. It is the same genius dealing with everlasting harmonies that in the one case has given us the philosophy of creation and in the other its song. The discovery of the solar system was as true a poem as any that was ever put in verse. The imagination of Newton was what first leaped forward and seized the great law of gravitation, his figures and facts only coming up afterwards to support the position already taken. Copernicus, Leibnitz, Newton, Herschel, Franklin, Kepler, even old Galileo himself in spite of his single act of weakness, were not only first-class philosophers, but first-class men. They wrought not for wealth, not for applause, not for any mean and selfish motive, but for truth, for stars of honor that sparkled only in some far-off skies, for kingdoms to rule in which only the mighty forces of nature were their subjects, for treasures to lay up which had no prices quoted in any markets of

earth. Their love was truth. And when her bright form was won, how often with great strong hearts and all knights' chivalry and unflinching faith behind the sharp edge of intellect, have they stood up for her against the neglect and scorn of the world. "The book is written," said the enthusiastic Kepler when he had completed the great work which made him legislator of the skies, "to be read either now or by posterity, I care not which, it being willable to wait a century for a reader as God has waited 2000 years for an observer."

Nor is the vindication of this faith and the way in which science has come up from its humble birth and won the homage of the Church and the world the least thing in its romance. No boy starting out of his cottage home in life's bright morning, friendless and alone, his whole capital the brave heart in his breast and the little bundle of clothes at his back, to win a place in the world ever began lower down or went through a series of more trying adventures. Philosophy out of its empyrean heights looked down on its plodding methods with contempt. If there was one thing which war and trade and the world at large regarded as more impracticable and of less value to themselves than another, it was its truths and speculations. And religion,—Roger Bacon languishing for

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ten years in a Franciscan prison as the penalty of his meddling with retorts and gases; Kepler obliged to turn aside right in the midst of his most brilliant discoveries and spend five years in defending his old mother from the charge of witchcraft; Copernicus hesitating to reveal the truth of the material heavens for fear of losing his place in the New Jerusalem; Galileo working out the shining problems of astronomy on the walls of the Inquisition; these are types of the position it occupied age after age. The demonstrations of geometry were confuted with a bull of the pope; little bits of Scripture brought to bear against the most established facts of nature; the earth made to stand still by putting in prison the man who said it moved, and each new discovery of reason confronted as an answer with all the antiquity of faith. Yet against these obstacles the young stripling step by step has won his shining way to the foremost places in the realms of truth and power, his path marked not more by the brilliancy of his own discoveries than by the thousand errors and superstitions he has split open and battered down among his foes. There never was another career, even on the pages of the novelist and poet, that was more romantically successful or such a testimony to the force and skill of simple truth, never one that on the whole has been

more nobly or modestly used. What if he is a little overbearing sometimes to his old antagonist the church, or rather to the old spirit of ecclesiasticism and priestcraft and likes to give it now and then a sharp thrust? It is only poetic justice. A few years ago an eccentric amateur of science in Brooklyn, N. Y., was terribly annoyed by urchins who came and rang his door-bell at all times of the day and night, making their escape before ever he could get to the door. He bore it patiently awhile; but at last attached the bell-wire to a powerful electric battery, and with a smile, calmly awaited the result. It was not long before a band of urchins silent and sly crept up to give it another pull; and not long again before there was a terrible outcry of pain from an amazed pair of lips, and a very hasty exit of the whole band with their feelings woefully shocked. So with the priests that age after age have gone to the house where science lives, calling it up day and night on all sorts of frivolous charges and often dragging it away to dungeon-cells and midnight tribunals,—it is not an unpleasant thing to see that now there is a powerful battery attached to the door-handle and that every time they go near it, they, too, come away terribly shocked.

But if not in religion, yet surely in every-

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thing else science has proved itself the advocate and friend of what is noblest and best in human progress; has come back in its manhood to the old neighborhood from which as a boy it went in such poverty and disgrace, as the large-hearted and munificent benefactor. Speculative philosophy is proud to own it brother. Every vessel that crosses the seas, every art and industry, every sphere of our common life, is enriched by its bounties. No god of the old Olympic knights, going down to mingle in the wars of men, ever carried such a tremendous presage of victory with him as the side to which it now goes in battle. And when the old spirit of personal heroism and the new one of science are combined as they were in that grandest product of our civil war, the noble old Farragut, it is hard telling which shows to the most advantage, the one as the hero of Mobile Bay lashed to the mast of the *Hartford* damning the torpedoes and taking his flagship into the very hell of the fight, or the other as the same hero at New Orleans, ranging his fleet two and three miles away, and amid all the excitement of a battle dropping a shell with the accuracy of a clock every thirty seconds for six days into the heart of the beleaguered forts,—only this being certain, that nothing on this earth can stand them both, nothing be

found in the famous wars of old that can equal for romantic valor these battles fought with manhood's heart of fire in science's ribs of steel.

Look, too, at some of the special incidents in this brilliant career. The smallest events open up with dramatic ingenuity into the grandest fields of action. Vast Amazons and Mississippis of truth out of springs far back in the mountains that a pebble might have stopped. How like another story of the oriental genii rising out of their casket up to the very heavens is the record of galvanism with the telegraph and all its vast stretch of wonders, originating from the twitching of a frog's leg hung up accidentally with a copper hook on an iron nail, and that the telescope which has been to science as another eye out of which it has looked how far and discovered wonders how great, should owe its existence to the little son of a spectacle-maker playing with the glasses in his father's shop! Who can remember without a thrill that silent hour of night under the fair Italian skies when Galileo turned the Tuscan optic glass the first time to the heavens and beheld what no mortal man had ever gazed on till then: phases of Venus, the rings of Saturn, the mountains on the moon and the four satellites of Jupiter; the dividing hour of the old astronomy from the new? What is there in the most romantic

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novel's description of the meetings of Arthur and Amelia, in the depths of the forest, after their long parting, that is more thrilling or has a more wonderful series of events growing out of it than the scene when Franklin went out into the fields that summer afternoon to meet and woo the lightning,—the black thunder-cloud in the background angry, one might think, at the prospect of losing its long secret, the little kite stooping out of the sky as an angel bearing a message unheard of before in all its annals, the silent earth around hushed as if to catch the first whisper of the new truth yearned for more than summer shower, the long moment's agony of doubt, and then the bristling up of the little threads beneath its tread as the mighty secret along its slender way came rushing down, the heroine of science into its hero's arms? Who is not willing to forgive apples which from the times of Adam and Eve down to the ones we ourselves ate green as children through those of Paris and Helen have often played such a conspicuous part in human destiny all their maligner influence for the sake of the one noble specimen, sweet and rich with so many precious truths, that fell before Newton's eyes bringing with it the great law of gravitation? And what is there in any chase that knightly band went forth to, out of

baronial hall with winding horn and mettled steed and eager hound in the proud days of old, equal in excitement and grandeur and romance to that on which Leverrier started forth one glorious morn, his game another world, the forest in which it roamed a wilderness of stars, the only footprints it was known ever to have made, the perturbations of another planet two billions of miles away so slight as to carry it only a few minutes out of its course, and with simply his long array of figures and algebraic signs, as the hounds, with which to hunt it down,—what victory, too, more grand than when after seventeen months' pursuit over paths and through depths of far-off space not even thought had ever trod before, his trained and faithful band hemmed in and brought to bay a monster world three billions of miles away from earth which human eye had never known till then, so that writing to his friend in Germany where to look, having no glass himself, the telescope the next night was turned to the spot, and lo, there it was within a single degree of where the figures had pinned it down.

And the results of scientific discovery, the majestic facts which year after year it has brought to light, how they appeal to wonder, to admiration, to the imagination, to our sense of the beautiful and sublime, to almost every

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faculty of our being that poetry itself has ever reached. The human body, the body of the humblest Amelia that ever charmed the rustic eye, though resolved by the first touch of science into only a few salts and gases, is shown by its deeper reading to be a magnificent palace, the masterpiece of nature struggled up to through myriads of years and put together with a skill, style and beauty of finish that no architecture of the middle ages, no artist of to-day ever devised for princely blood, a throne of the spirit where a thousand subtle forces form a realm as wide as the universe, and pay their homage, worthy in its glory of all the most enthusiastic lover has ever put in song. Matter itself, the mere dust which is blown about our streets and pressed beneath our feet, the despair of the poet, the symbol of all that is vile and worthless, the thing which even theology has made the type of death and source of evil, rises up under its magic touch endowed with laws and qualities, and possibly arranged, each particle of it, in world systems as rich and harmonious as those of the brightest stars above, and with a substance as immortal and for aught we can now say as godlike as that of the purest human soul. It opens the bosom of earth, this earth it was accused at first of rendering so prosaic and commonplace, and

reveals it through myriads of years all filled with animals and plants, scenery and action, that for strangeness, variety, for picturesqueness and dramatic unfolding, make the gods, the fairies and genii, the myths and marvels of the Arabian Nights, the Norse Edda and the old classic mythologies only as the crudest shadows, yea, tells out of its cavern mouths and stony throats and lava tongues, the history of creation with a fullness of detail and a wealth of illustration that not even the religious vision had ever given it before;—carries us back through the long ages of the past to that far day when the globe was all a molten ocean with surges of fire that swept from pole to pole; tells of a time when chaos and night sat brooding o'er the dark profound, when the roar of the hurricane above was answered from hour to hour by the crash of the earthquake beneath; a time when continents rose and fell as the tides of the sea, and mountains were doubled as bits of cloth and the world as a bird in its shell under the spirit that brooded over the deep was taking its first rude shape; turns us onward to the scene when the first beam of sunlight broke through the Cimmerian darkness, when the first rock raised its head above the ocean surges, when the first blade of grass sent its shaft life-laden out of the soil and when the

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first bird broke with its voice the long discord of the elements and sent over a wilderness world its harmony, prelude of what the angels sang and prophecy of the anthem in which all its myriad children are at last to join.

So with the realms above, so with the phenomena which, day by day, are passing before our eyes. There is not one it does not clothe with beauty, not a poetic myth of the olden time it sets its foot upon, that it does not lift in its place a score of grander truths. The myriad particles of vapor rising up everywhere on electric wings from the watery surface of the globe, marshaling themselves in cloud squadrons over the summer sky and coming to the relief of drouth-beleagured cities and fields in the long serried columns of pattering rain, then making the whole world, from dewy flower and evening sky to woman's cheek and childhood's form, flame up afresh with loveliness, are surely no unfitting counterpart to the old myth of how Venus the goddess of beauty was born from the foam of the sea. It can hardly be spoken of as a loss even to poetry that the lightnings of the summer shower instead of being the angry flashes of Jove's wrath are recognized as the subtle lances that electricity is shooting through a thousand monsters of miasma and disease in a mighty

war it is waging for the welfare of man. The moon as the lover's lamp and the queen of night and with all the pretty epithets which the poet has hung around it is now trivial in its appeal to the imagination as compared with the thought of science that it is the dead child in the great household of worlds, a globe, once indeed with its verdant fields and swarming cities, its throbbing hearts and eager minds, its poems and knowledge and civilization and history, but now every vestige gone, as gradually through the long ages of the past the air and water on which they lived were combined with its solid elements, leaving it to swing forever a gilded tomb in the silent sky. What is the classic fable of the sun as a fiery chariot that Phœbus is driving with flaming steeds across the azure arch, to the vision that blazes upon us through the telescope and spectrum, of a molten world, composed of the same elements as our own earth, only twelve hundred and fifty thousand times as large, a world where the winds and clouds are vaporized metal and the heavens melted brass, where the oceans and rivers are made of liquid gold, where fountains bubble up with fire and the showers descend in silver rain, where the snow-drifts are quartz and diamond and the dewdrops literally are precious stones. How the old notion of the

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heavens as an arch, covered over with the absurd figures of men and beasts, is dwarfed before the splendid truth of astronomy that they are the boundless reaches of space filled with myriads of suns and worlds and systems of worlds endless in variety, by the side of which our own earth is but a grain of sand on the sea-shore, many of them so far away that light itself is ages in coming to tell their story; yet all bound together with harmonious laws and peopled, it may be, with a myriad forms of conscious life, a single dash of science that in place of the old intelligences it has swept away, gives us what crowds of beings for the fancy to play among! The story of the ancient argonauts launching out for four years along the untraversed shores of the classic world in search of the golden fleece and appealing so with their strange adventures to our young imaginations, who will say it is not more than matched to-day by the astronomic story of our whole earth and its kindred worlds launched on the soundless depths of space sweeping onwards for millions of years under breaths no sails are raised to catch, spoken ever and anon by flaming comets, plunging through meteoric streams that blaze with phosphorescent light around their prows, rounding in the course of ages vast sidereal

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capes, beholding the star groves they have left myriads of miles away close slowly up behind them, and bound for a golden fleece to be reached at last who shall say on what far astral shore!

Then, too, there are some of the fairest dreams of the ancient philosophy that the magic hand of science is touching, only to transmute into a still grander reality. The old Ptolemaic notion of the music of the spheres finds its consummation in the beautiful fact that the waves of light which make the different colors, pulsing out forty and sixty thousand of them to an inch and at the rate of one hundred and ninety-two thousand miles a second, all have a rhythmic relation to each other just as much as the waves of sound, and that planets and suns and stars, the whole vast host of the heavens above us, are actually moving onward to melodious measures and with literal truth "forever singing as they shine." In the autumn of 1859 as the astronomer Carrington was watching the sun with a powerful telescope, a bright spot was seen suddenly to leap upon its surface, and instantly the self-registering magnetic apparatus of the Kew Observatory was sharply disturbed, a violent magnetic storm began its sweep over the earth, telegraphic offices were set on fire, brilliant

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auroras flamed up in the northern and southern hemispheres, a thousand human lives hanging by subtle threads in hospitals and sick-rooms were cut off or lengthened out, and the magnetic wave sweeping onward from the confines of earth dashed in amid the asteroids, made the huge body of Jupiter thrill from pole to pole, played a moment over Saturn's silver rings, rolled over the shores of far-off Neptune, and spent its force, who shall say in what far-off depth of stellar space. It makes of the solar system not only a vast unmeaning machine bound together with the laws of gravity but a mighty organ whose keys, far down in the sun's depths of light and heat and magnetism and actinic force, have need only to be touched by the divine fingers and lo, a new song of life and death, a new march of peace and war, is played through uncounted worlds, a hint, is it not, of how spirit acts on spirit and how the touch of prayer is made to send its thrill, and of hate its shudder amid the realms of soul; at any rate affording a grander reading than any commentary of theology has ever given of the Apostle's words: "We are members one of another." Light itself, so subtle, so wonderful, so swift, so like a flash of spirit, has not only been measured and picked apart, and its threads of color untwisted and

made to give up the inmost secrets of its own being, but is actually found under the eye of science to be written over in its spectral lines with a language impressed upon it by every substance which has sent it out, a language which can be read as surely as that of the printed page, and which it conveys as swiftly as though Ariel had indeed brought its message sliding down to earth on a sunbeam's slanting ray, and which tells us of the very things of which the heavenly orbs are made, tells us of salt in Sirius and bismuth and lime in Beltegeux; that they burn hydrogen gas in far-off Eta Argus, and that there are parts of the Milky Way in the heavens above us which literally are paved with gold. The Darwinian theory of Creation, recognizing only one great tree of life rooted far down amid the rocks of the geologic ages, growing upwards for myriads of years and sending out of itself all the world has ever known of being, thought and civilization, a theory full of mystery, full of romance, aye, and in spite of all the Church has said against it full of religion too; a theory unproved as yet, but bearing on its brow the very lineaments again of all past truth, what is it but a new and grander form of Yggdrasil, the mystic tree of life, bearing the natives on its

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branches and having memory and hope, having all history and philosophy and literature in the whisper of its leaves, the wonderful ash that plays such a part in the old Scandinavian mythology. Science unpoetic, science filling the world only with dreary facts! Why, under its magic touch what is the whole universe but a mighty romance whose characters are stars and planets and the elements, not less than human beings; whose chapters the geologic ages, and scenery the gorgeous heavens and vastness of stellar space; a romance of most startling interest whose far beginning we have read and some new page of which is published from day to day, but whose plot, so intricate and wonderful, no human skill can unravel, and whose dénouement in the eternity to come science alone, science without the subtler sight of faith, must try in vain to tell.

And this fact, the fact that with all its powers it is not able of itself to solve the great problem of the universe, brings us finally to the thought that science is not wanting in that element which is needed to make every romance complete, the element of love and marriage. Ages ago it was not only the friend but the lover and betrothed of religion. Born amid the retorts and crucibles of old Friar Bacon and nourished awhile under the

sheltering roof of the Church, religion knelt with it beside the altar, captured not a few of its tools, some of which, as the crucible, bear names of her betrothal down to this present day, and lavished upon it all the fervor and enthusiasm of her early love. But like so many other lovers they soon had their quarrel. The one was proud, aristocratic, conservative, orthodox; the other earth-born, democratic, radical, heterodox. Sharp words passed between them; their hands and their paths parted. But it is a separation which cannot last forever. Religion, though it has had many other lovers,—philosophy, logic, wealth, literature and state, has never met one yet that has come so near to her heart as this. And science, though it has grown rich and strong and found a glorious happiness in its work, is still homeless, incomplete and with a yearning ever and anon for the help which only religion can give. They are, after all, complements of each other, the one masculine, daring, strong, the other reverent, loving, tender,—both the children of God, both embodiments of the everlasting truth, both sent to earth on a mission of love. And at last the one liberalized and the other sanctified they shall make up their quarrel and stand together as lovers again before the great altar of nature. God himself

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shall perform their marriage rite, the fairest stars of heaven sparkle as the jewels around their brow; earth brings its flowers from ten thousand fields to throw at their feet, all the harmonies of this lower world join with the choirs above in singing again as their wedding song: "Glory to God in the highest, peace on earth, good will to men." And the romance of scientific discovery shall be complete in its finding what is richer than all the jewels of earth, fairer than the brightest orbs of night, grander than all the laws of matter,—the pearly gates of the spirit world, the luster of the immortal soul, the heaven-born laws and the long-lost love of a sweet and true religious faith.

II

WHAT EVOLUTION IS

This old world of ours, though so monotonous and prosaic in its ordinary events, has had ever and anon its special incidents, inconspicuous at the time, but which, as seen now, are thrilling beyond anything romance has ever devised. One such was when the first human hand struck a spark of fire out of earth's physical darkness, sending its light down the long vista of civilization's future; another when the first human mind struck the idea of decimal notation out of its mental darkness, giving to progress an intellectual helper second only to what fire has been in its physical realm; yet another when Faust first put his movable type together, sending out over the world the light of thought; others when the words liberty and love first trembled on the lips of society and religion,—and others still, when Columbus, voyaging with his three ships across the sea, first beheld this new world, and Galileo, voyaging with his optic glass across space first

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saw the moons of Jupiter, the phases of Venus and this new universe, and Newton, voyaging with his figures across a sheet of paper, first beheld the secret of what holds all worlds and the universe itself together. But, after all, none of these have surpassed in significance the proclamation a generation ago of the great doctrine of evolution, none given the world a light so splendid or wrought in its other ideas changes so vast. Ridiculed and trampled down at first, as all seed truths are sure to be; charged with making man a monkey and God a monad, it has won to itself, in a single generation, the faith of all scientific thinkers, the homage of newspapers and reviews, and the respect of pulpits and theological schools. Though not by any means new in its material, though itself an evolution on whose parts all sciences and all thinkers from the very beginning of mind have been working, it is most emphatically a new use of the material, a putting together in one vast structure of what hitherto had been regarded as separate buildings. Other philosophies, to be sure, have attempted the same thing with regard to special departments of the universe,—some its cosmogony, some its organic kingdoms, some its society and politics, and some its religion and ethics, but the grandeur of evolution is that it shows

how one set of principles runs through the product of everything, from the making of a weed to the making of a world, and from the lowliest realm of matter up to the loftiest reach of society and the soul; to the striking out of a spark which lights up all the past as well as all the present, and reveals the connecting link of all worlds in time, as gravity does all worlds in space. And though it is not by any means complete, has many missing links to be supplied and some of its territory fiercely in dispute, its main principles are settled as sure as truth itself, and transcending all the other grand contributions of our age to the world's progress, it bids fair to be the one thing which is to make the nineteenth century forever memorable in the history of human thought.

Who will say that such a subject is not one which every person living in the world to-day ought to know something about? It is not a mere far-off speculation, not a department of knowledge which belongs properly to a few professional philosophers, but one which is full of great practical truths, one which embraces the laws of all healthy living and successful work, one which affects the aspect of every object the whole universe has to show.

Several years ago, while exploring with a party of friends one of the many crablike arms

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with which Puget Sound on the western side of our country crawls back from the sea up into the land, our boat anchored for the afternoon in a picturesque spot under the Olympic Mountains to allow the amateur artists on board, mostly ladies, to make a sketch of its beautiful scenery. Suddenly the silence of lead-pencils which had reigned supreme for an hour or so, was broken by the horrified exclamation of a feminine voice: "Oh! oh! oh! we're all adrift." It was occasioned by a change of the tide, which up there among the innumerable inlets it has to visit, often loses all sense of its obligations to the almanac and the moon, a change from ebb to flow that was bearing our boat from its anchor a cable's length the other way. On coming to a stand again, which it did in a few moments, most of the artists recognized the changed perspective and began their sketches all over again, but others, hating to lose their previous work, went on and finished up what they had started upon by adding to it the incomPLETED things, some as they remembered them and some as they now appeared. At the close of the afternoon we organized an extempore art exhibition in which the wholly new pictures, though somewhat hasty, showed up fairly well. But the others! Besides the hor-

rified jerk of the pencil where the exclamation "we're all adrift" had come in, as unmeaning in art as the sudden quirk was in chirography which used to adorn our writing books at the district school at the point where the master had come up from behind and rapped our knuckles with his ruler to keep us from making crooked lines,—besides this, the most ludicrous results had arisen from the mixing up in them of the two perspectives, the houses and logs with both ends visible, the dog, the Indian and the white man each with a double background, and a beautiful waterfall and long vista through the woods, which could not be seen at first, compelling a place for themselves in the final sketch; and as we compared the two sets of work, we all concluded that the best way to make pictures when the tide has turned, is to drop the old sketches and draw every object from its new point of view. Well, what took place with our tugboat on Puget Sound, has taken place in our day with the bark of thought on the sea of life. Its tide has changed, the great tide of philosophy, and changed with it the point of view from which the whole universe is to be seen.

There are some beholding the change who are exclaiming in horror that we are all adrift; some who refuse to recognize it, going right

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on with their work as if still at the old creation standpoint; and some, who while recognizing that they are at a new position, think that the only safe way is to mix up the two views in their work,—look at nature and natural science from the standpoint of evolution, and at religion and ethics from that of creation, and who, with a miracle of perspective such as the devoutest saint painter of the middle ages never dreamed of, represent the Bible, Jesus, Christianity and our human nature as having at the same time a natural and a supernatural origin. But evidently, if we would not make our work ridiculous, the only true way is to lay aside reverently all forms of it drawn from the old position, keeping only the ripened skill gained from it, and do everything now from the new standpoint of evolution.

Preëminently is such a change needed with regard to religious work. Its great eternal objects, God, man, the universe, duty, virtue and immortality, are indeed the same in themselves, but their perspective, their lights and shadows, and their relations to each other and to the eye which sees them, these have widely changed. Their supernatural sides and ends, those which from the old standpoint were often the only ones seen, have disappeared, and their natural ones come, as never before, into view.

Henceforth, if we are to have any complete and harmonious religion at all, it must be the one which evolution reveals. And it is a most remarkable coincidence that now, when under the influence of science and criticism and the world's changed spiritual atmosphere men's faith in the written Bible as an authority is being so rapidly weakened, this larger, unwritten Bible, with its new interpreter, should so naturally and commandingly sweep into its place.

What, then, is evolution? We all know the famous definition of it given by Herbert Spencer: "An integration of matter and concomitant dissipation of motion during which the matter passes from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity, and the retained motion undergoes a parallel transformation." It is a definition which is admirable for scholars who have the strength of mental jaw that is necessary to crack open the nut of hard words and get out their inner meat of meaning. But there is a much shorter and easier one for those who like their intellectual food more free of shells, which expresses its central idea equally well. It is that simply of growth, is the doctrine that everything which now is or ever was or ever will be, including the universe itself with all its changes,

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is the outcome by natural laws and forces of all its preceding states. It is not a principle thus stated which in itself is very new or startling, is what men have always known and held to be true of some things in the universe, as the flower, the tree, the animal, the state, but is something they had hardly thought of before as holding good with reference to the universe as a whole. They were like the negro girl Topsy, who, when told that God made her, loudly denied the statement as ascribing to that individual too exclusive a credit, affirming that what God made was "just a little tot so high" and that "she herself had growed the rest,"—only the theologians laid the chief stress on God's part of the world affirming that he made the universe so high that all it had growed itself was a little tot here on earth. Evolution, therefore, merely extends to the whole what everybody had thus believed in part,—teaches that it all grew, earth and oak, universe and animal, solar system and soul. Arcturus and his suns, Adam and his sons—give allopathically in suns and stars the truth which others had administered homeopathically in acorns and animalcules, and set forth also, as never before, the method of its one growth. What converted me to it at first was not Darwin or Spencer, but an illustrated lecture on

the growth of an egg into a chicken which was given years ago by a naturalist who was then a decided anti-evolutionist. He drew representations of what took place in the egg each day, from its condition as a simple homogeneous cell through its segmentation, gastraea stage, separation into ento-, endo-, and mesoblast, and unfolding of these into intestines, heart, lungs, bones, brain, eyes, feathers, wings, till out of that one material, without any outside help, there came the living, many-organized animal, able thenceforth, till man's need of chicken broth came round, to take care of itself. And as I saw the process, I said to myself, and said afterwards to him, "Why, what is this but a type of the very thing which evolution claims has taken place with this whole universe,—the segmentation of its nebulous egg into solar systems, then their folding over into the three layers of suns, planets and satellites, and, finally, their gradual development into the backbone of continents, the arteries and heart of rivers and seas, the limbs of genera and species, and the eyes and wings of mind and soul?" He answered: "But there is a life principle in the egg without which it never could have taken place;" to which I replied, "True, and so as a Christian I have always believed there is in the universe,—that

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it is not a dead universe, but a live one,—has been so from the start; and if this little finite life of an egg can evolve within itself a chicken, why not in the same way the infinite life of a nebula evolve the universe?" I did not see the lecturer again till five years had passed away; and then, to my delight, I found that he, too, was a full-fledged Darwinian lecturing on evolution, had got his fledgling, as he told me, the same as I had mine from the wings of that chicken. And the best way in which for anyone to prepare his mind for a flight into the loftier regions of this whole subject is for him to begin as Darwin himself did with the familiar everyday phenomena which are right around him—go out into the barnyard and dove-cote to learn the origin of species, study the flower in the crannied wall to know what God and man is, and touch the hem of the garment of nature's great miracle-worker in weed and worm, to get a knowledge of the mystic virtue out of which come sun and star.

The growth of inorganic things, sun and star and the world at large, is indeed different, in many respects, from that of seed and egg, the one being the result, apparently, of external forces, while the other is the unfolding of a principle from within. But the differ-

ence is one of degree rather than of kind. The egg and the seed are dependent on outside warmth and food and a suitable environment for their growth, while who has ever watched the shaping of a crystal, each particle going to its own exact place without outside help; or the wonderful combinations of chemistry where each element selects, unaided, its own affinity; and not felt that equally with organic growth its controlling power was within? How inevitable in the world around us is each new state of things the outcome by natural laws and forces of its preceding state, and that again of some other, and so back as far as mind can go? Who has not had repeated experiences in his own career, of how little incidents, chance meetings and careless words too insignificant, apparently, to be noted even in the minutest diary, have been the grains of mustard-seed out of which have come great trees in whose branches all the birds of his life's air have made their nests? What is all history but a process in which every event is at once a fruit of the past and a seed of the future, a seed which often grows more wonderfully than any that was ever planted in garden or nourished with food? Moses carried from the Nile a few select principles of the old Egyptian civilization, leaving its massive tree to die, and

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out of them developed what splendors of Hebrew thought. Jesus, a direct product of Hebraism, scattered on the soil of Palestine,—he himself called them only seeds,—and to-day half the world is eating what they grew to. Almost three hundred years ago a couple of vessels crossed the sea, one with slavery, the other with liberty, in its hold; and, planted on the same soil and influenced by the same environment, read on a thousand pages of American history written out in black and white and red, what they ripened to. Two hundred years later a descendant of that old Puritan stock, mobbed, ridiculed, despised, sent forth his ringing cry: Emancipate the slave!

“And his air-sown, unheeded words
In the next age are flaming swords”

on the points of which blossom Gettysburg and Appomattox Court House, and, added to the human race, four millions more of free men. And with the great field of all time filled with such things as these, who will say that there is any better definition of evolution than to call it simply growth.

In subsequent lectures I shall speak of the various stages and factors of this growth, of its bearing on the several doctrines of religion, and of how beautifully it lights up and explains

some of the darkest features of nature and society, and intensifies our hope for a better future alike here and beyond the grave; and I shall try to do it not by doctoring the genuine article with any pious supernatural drugs, not by covering up its secular week-day working limbs with any tailor-made Sunday clothes, but by presenting it from the scientific standpoint exactly as it is, looking squarely at its darker and more terrible aspects, and only putting in words the higher meanings which its own dumb lips are speaking in signs. At the opening meeting of a class for its study which I had in Hartford, Conn., made up from people of all faiths and of no faith at all, I laid down a similar platform,—said I should not try to twist it into the support of any doctrine or any church, but aim, first of all, to get at its own exact truth, and asked that they would then join with me in recognizing whatever either of religion or anti-religion that truth itself might stand for. Conducted thus, many people who could not have been drawn by a cart-rope into a professedly religious service, felt free to come into what was only by nickname “Mr. Kimball’s Prayer Meeting,” and though some sensitive souls were now and then troubled with the shock it gave to their old ideas, it was merely to come out afterwards into

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a richer new faith, and at the close of the first year, one young man representing many others, said to me, "Until I came to these meetings I was a downright atheist; and if you had attempted to use them directly for my conversion, I should have taken the alarm at once and fled, but when you proposed that we should all be ready simply to look where the thing pointed, I could not refuse; and now I want to tell you that while I am very far from being a full noon-day Christian, I have got the first gleam of light on religion that I ever had, and that I am so well pleased with it that I am going to follow it up and try for more."

Does not the conception of the universe as the outgrowth, all through, of its own inherent forces without the need of an outside Creator, fairly viewed, increase a thousandfold rather than diminish its real religious significance? It is only savagery which thinks that a thing to be done by Deity at all, must be done by him from the outside, and each thing by a separate act,—it is the first step of science to recognize that it may be done more divinely from within, and by the hand reaching from one thing into another of natural cause and effect. When we were children, and little baby brothers and sisters came into the family, and we older ones were curious as to where they came from, our

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ints and fathers used to tell us that brought them, an answer with which, as that functionary was always such times, most of us were satisfied now and then an inquisitive youth the question back of that, as to where Dr. Deity got them, an inquisitiveness for as we well know, its exhibitor was given a slap on the back and told to go

And that was the old way of answering the question as to where new species of animals, plants and worlds came from, that a doctor Deity brought them, an answer with which multitudes of grown children were once satisfied, though occasionally even then an inquisitive scientific brother would ask yet further where Dr. Deity got them, resulting, alas, how often, in having a theological father shut up his mouth forever and send him to a graveyard bed. But now man has grown up to manhood, and there is no longer any reason even in the prudery of theology why he should not be told the whole exact truth,—that species come from species, and worlds from worlds, by a power within themselves; that the universe itself, with all its grandeur, was once a mere embryo babe in the womb of time; and that nature everywhere, as its name implies, is what forevermore is being born, evolution every-

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where what forevermore is growing up. The very last thing with which to charge such a view is irreligion. Who that has not had his eyes blinded with custom, can go out into his garden in springtime, and see the humblest plant making its way without spade or hoe out of the dark soil, unfolding, unschooled, its needed stalk and leaves, and painting and carving its flower and fruit from an ideal within itself, and not feel a thrill of wonder? Who can take his little daughter in his arms, a mere lump of flesh, and behold feature after feature rounding into beauty and faculty after faculty into brightness, till glorious womanhood is reached, all by a power which he knows is not his own, and not feel that here is a temple above all that art has ever built, in which to worship, here an image transcending any that Angelo ever carved or Raphael ever painted, before which to bow? And to look with the eye of science on this whole universe sending up its first tender shoot out of matter's primeval soil, and carving on it the stalk of constellations and the leaves and fruit of satellites and suns, and to behold a baby-world shaping itself into the features of sea and continent, unfolding on its cheek the beauty of sunsets and flowers, and growing up into the faculties, one after another, of love and thought and soul,—if there is any-

thing, anywhere which can give man a sense of the Infinite Mystery, is it not such a sight—anything, anyhow, which can move him to religion, is it not such a marvel?

III

THE THREE GREAT STAGES OF EVOLUTION

Evolution was defined in my last lecture as only the more scientific term for what is ordinarily known as growth. But what is growth? The idea commonly prevailing that it is merely an increase of size, loses sight of its most essential features, and is one which, in the interests alike of science and morality, we need most emphatically to get rid of. You have heard the story of the old deacon, who mistaking the label which had dropped from his wife's spool of cotton for a piece of court-plaster, deliberately placed it, one Sunday morning, on his naturally enormous nose so that as he went round for the contributions, all the smiling congregation read on it, "Warranted to hold out 200 yards." And yet, ridiculous as the deacon's mistake was, how many are the millionaires, and how many the cities, and nations, and even churches, that as the evidence of their growth, are striving consciously and proudly

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to label its one enormous feature with precisely the same outward assurance. What we need to learn is that the chief element of all real growth is interior, the arrangement of its material, whether more, or less, into new organs, and these into the capacity for new functions.

The growing nation is not the one which is adding Canadas and Cubas and Hawaiian Islands to its borders and half-breed millions to its population, but the one which is adding arts and sciences, and a higher civilization, and a better internal organization to the extent and people it already has; the growing church, not the one that is increasing in noses and square feet, but the one which is increasing in knowledge and square conduct; and as regards the individual, it is not till he has done growing as an animal that he grows fastest of all as a man. So with evolution. It is a process which goes on within, an increase in organs and functions; and there are three great stages to it, each of them independent of any outward enlargement, which to get a clear idea of it, need to be carefully studied.

The first is that of homogeneity, or sameness, a stage in which the material to be evolved is all of one kind in one condition and without any division whatever into organs or parts. It is a stage whose recognition is one of the great

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distinctive points in the modern Spencerian idea of evolution, as against the idea of it which once prevailed. The old theory held that the starting place of all growth was a minute image of its adult form, a germ in which everything existed exactly as it was afterwards to be, only on a smaller scale; and it was thought that if science merely had a microscope powerful enough, it would see in every cell a portrait of the future animal, and in every seed a picture of what was to rise from it as a full-grown plant, a theory, very singularly, which in a modified form lies at the foundation of Weismann's famous doctrine of heredity. As a matter of fact, however, the most powerful microscopes, instead of revealing any such images in the germinal cells of animals and plants, are able to find in them only a minute particle of almost wholly unorganized protoplasm, with no more resemblance to what grows from it than a bed of clay has to a completed and many-roomed brick house. And though it is doubtful whether there is anything in the universe now which is at its perfectly homogeneous stage, even its raw material having been ages ago wonderfully elaborated, yet, whenever we do go back to the starting-point of any of its special forms, we find infallibly an approach to such a stage. The oak begins

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its growth as an acorn, without root or limb or trunk; the animal as a blending of two protoplasmic cells, without muscle, bone or brain; all life as we go down the rocks, in simpler and simpler forms till its two kingdoms unite in one protistic root. Society, at first, had no distinction of classes, or occupations, or institutions, or property, or even of wives and children, each of its members being at once hunter, warrior, farmer, mechanic, and all things being held in common. Even in the realm of mind, the five senses of the earliest animals were merged together in that of feeling alone; all their faculties in those of nutrition, reproduction and defense. Language, to start with, was only a single guttural sound; grammar for ages only a noun and verb; mathematics only a counting of five and ten; and religion only a superstitious fear. Back of all history the earth itself was a molten globe without mount or meadow, sea or shore. And going back still further, evolution holds that the universe as a whole,—all worlds, all animals and plants, all matter and all that matter has ever been or will be,—was simply a nebulous mist, homogeneous in substance and all diffused in space, or, as the old Bible has it, was "without form and void."

It was an original state of things which, esthetically viewed, was dreary enough; a cloud

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unrelieved with even the possibility of a silver lining, but one which from the standpoint of evolution was full of profoundest interest. What mother bending over the undeveloped face of her babe asleep in its cradle, ever found it dull and dreary,—did not read in its unwritten lines entrancing prophecies of a mighty future, and in its unprinted features whole volumes of heroic deeds and shining virtues; and when the undeveloped face was that of a baby universe lying asleep in its cradle of space, how much more fascinating to the scientific eye its apparent blankness. As Henry Ward Beecher was walking along a country road one day, he came across a boy playing in the mud, and thinking to quiz him a little, he inquired what he was doing. "Making a meeting-house," replied the boy. "Yes," said Mr. Beecher, "I see the meeting-house, but where is the minister? Why don't you make him, too?" "Because," answered the boy, glancing at the cloth of his inquisitor, and taking in the situation,—"because there wasn't mud enough here to make a minister with." But in nature's original mud there was no such deficiency. Space was filled with enough of it to make not only ministers and meeting-houses with, but all even of the subtlest things they have ever stood for, since. And though it had no actual image

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of anything within it, it had the possibilities, and the laws, and forces, out of which everything was to come, had them, too, independent of any disturbing environment, so that an intelligence knowing them all, might have read in it then, not with a mother's fancy, but with a mathematician's figures, the whole of its after history,—all the starry worlds it would sparkle with, all the races, nations, civilizations and religions it would give rise to, all its coming literature and science, Homer's "Iliad" in something more original than its own native Greek, and Spencer's "Evolution" in the very atoms to be evolved,—all its battlefields and hero deeds and manly deaths, its every lover's vow and maiden's yes, Beethoven's symphonies while yet in the eternal silence, the Parthenon while still in its elemental dust, all even that any American Congress will ever do, its every event till the whole thing sinks back into a nebula again,—such the raw material, the great nebulous egg, with which evolution began its work.

Its second stage is that of differentiation,
the gradual separation and variation of its
homogeneity into a myriad distinct parts. We
hear a great deal said in our day about the
blessedness of unity and equality,—are inclined
to look on dividedness and diversity as the
source of all evil, indeed have implied as much

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in one of the names Deuce or Second, given to the devil; and sometimes think that to get rid of them and get oneness and likeness in their place, especially as regards religion, would be to get very near the kingdom of heaven. There was a young man residing in Boston, awhile ago, who was engaged to one of a pair of twin young ladies out on Commonwealth Avenue, both of them very beautiful, and so exactly alike that their own parents were continually mistaking one for the other. Someone asked him how in the world he was able, Sunday nights, when he went to do his courtships, to distinguish them apart—know which to kiss and caress and which to be only a brother to, a question this Boston youth, who in everything else had been taught to distinguish carefully between tweedle-dee and tweedle-dum, answered by saying unblushingly, "Well, to tell the truth, I do not try." And so there are many would-be reformers who would have every thing in the world, especially all churches, all creeds, all estates, all classes, so twinlike and perfect that there would be no rivalries, no competitions, no jealousies between them, no person interested to get the favors of the one any more than of the others. But nature, except now and then to a Boston youth, does not gratify such a desire, has made division and

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differentiation not lapses out of good, but a normal and vital part of all upward progress. The moment a thing begins to grow, it begins to divide and to have its divisions differ,—the seed into radicle and plumule, and then into all the multiplied roots, limbs, leaves, tissues and flowers of the full-grown plant; the cell into segments, and these into all the myriad organs: bones, brain, nerves, muscles, stomach, heart and the like, of the adult body; and life itself into the animal and vegetable kingdoms, and these into all the varied classes, orders, genera, species and varieties that zoölogy and botany are familiar with. The earth grew by separating its original nebulous mass into water, land and air, and these into all the long list of natural divisions that geographical boyhood, with a prize in view, learns to rattle off; the stellar universe by separating its diffused nebulous mist into suns, planets, satellites and comets, having its one star differ from another star in glory; the nebulous mist, probably, by differentiating matter into its sixty-seven chemical elements; and possibly matter itself out of some primitive substance where with ether and force it was all one. Mind divides in the same way into its varied appetites, affections, aspirations and faculties; speech into languages, literatures, sentences, words; poli-

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tics into parties; philosophy into schools; and, under precisely the same law, is it not religion, into religions, sects, creeds, churches and church splits. Even where there seems at first an exactly opposite law, what Darwin calls "the persistence of the type"—species of animals and plants, the same now as in the geologic ages, nebulae that have never functioned into worlds, religions and social states stationary since man became man, and an old fogginess now and then in our human nature itself which seems a part of its old primal mist,—even in such cases it is only a subtler method of variation, is differentiation itself differentiated; and its result a vastly greater diversity than would be possible under its uniform action.

What is the use of this dividing and differing that nature is so full of, what the part it has to act as a stage in evolution? One of its uses, seen especially in the organic world, is the getting of more food. Variety is not only the spice of life, but very largely its meal-earner, its cook and its main dish. One of the mathematical truths taught the youth of our land at college, and usually forgotten as soon as taught, is that while the bulk of bodies increases in proportion to the cube of their diameters, their surface increases only in pro-

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portion to their squares. It is a truth which every little cell, animal and vegetable, had to learn ages ago as the very first condition of its continued existence; that, too, without any colleges, or professors, or black-boards, or even brains. For its food being taken by absorption through its surface while its use of it was by its whole body, the larger it grew, the larger the disproportion became between its demand and supply, that is, every time it doubled in thickness, it had eight times as much body that needed food, but only four times as much surface through which to get it; and the question was, What are you going to do about it?—a question it had at once to solve, or starve. It solved it how? Simply by dividing its body into two parts, and then as fast as it grew, dividing it again, so that with the more substance to be fed, it always had in its smaller divisions more surface through which to get the food. I do not suppose there has ever been since, a mathematical problem on the face of this earth on which so much depended,—reproduction and all the immense social system of which it is the base. The wisdom it involved is what the statesman of the world with all their boasted brains, especially the Jingo part of them, have never yet caught up. We still think, even in our own land, that the mathe-

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matical law is the other way, namely, that the more a nation grows in bulk, the larger will be the proportion of its growth in the means of life, so are trying all the time to enlarge our territory. But nature does not change her mathematics in passing on from amœbas to Americas, and from cells to states ; and so it is a most remarkable fact, that while nations without number, trying to perpetuate themselves by adding to their outward size, have age after age disappeared, that first microscopic cell, which without book or brains solved the problem by making itself many and small, is, according to Weismann, the one living thing on this earth which has thus far proved itself immortal.

It is a wisdom which nature herself has used very largely all through her kingdom. Why does the tree separate into its myriad branches, twigs and leaves? Because thereby it gets more sunshine and air to aid in its growth than it could with them all condensed in a single trunk. Why do animals and plants divide into their different needs and capacities they get orders, genera and species? Because with vastly more nourishment out of their common earth than they could if all were of the same structure and had to feed on the same things. And is not this the very reason why, in the

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divine economy, religion, also, has divided into its innumerable sects, churches and creeds,— that matter about which so many people, despising the lessons of evolution, are so terribly troubled, because it gets thereby more of the eternal sunshine and air, and of truth and God, than it could if it were all gathered, as so many would have it, in a single church?

Along with the gain in food, which comes from differentiation, is its equal gain in efficiency. One of the sentences set for us to learn penmanship by in our old writing-books, was "Union is Strength," but coming in before that in the copy-book of nature was the exactly opposite maxim that division also is strength. An army with its forces differentiated into artillery, cavalry and infantry, officers and men, is surely a stronger army, though as regards the officers and men some of our militia regiments seem to think otherwise, than the one which has them all united in a single department. The sun which is going to make things grow, cannot, evidently, be one in mass with the planet on which the growing is to be done. The apostle Paul wisely asks, "If the whole body were an eye, where were the hearing? If the whole were hearing, where were the smelling?" What would society be as to efficiency, if all its members were mechanics or mer-

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chants or even ministers? That was a wise old deacon who thanked the Lord for his saints, but who praised him, also, that as long as there was so much dirty work yet in the world to be done (it was at the close of a great political campaign in which his party was victorious), there were also a plenty of sinners exactly fitted for its doing. And in the universe all through, it is its endless diversity of taste and talent which enables it to accomplish its endless diversity of work,—the worm which crawls, things which would have to remain forever neglected, if it were a twin with the bird that sings or the soul that soars.

More important still, if life had grown up a single homogeneous unit, it would necessarily have had as its moral qualities only selfishness and self-regard, would have been only a single spoiled world-child. It is because it has differences, that each of its members has somebody besides himself to love and enjoy; because it has differences that it has affections and friendships and families and society and self-sacrifice and ethics and all the highest qualities of soul; and with all the strife and alienations which it also involves, who that has ever known what love is, will say that the dividedness which has made it possible is not worth a myriad times over, all its cost?

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It is this love made possible through differentiation, which opens up into the third great stage of evolution, that of integration, or the coördination and joining of its diversities, each undestroyed, into a single organic whole. Separation with all its prominence in nature is not an end, but a means; and as soon as the parts have been separated long enough to be in no danger, when left to themselves, of flowing back again into homogeneity, the alienations and hatreds which kept them apart die away to make room for integration, and it is to be especially noticed that the differences themselves, instead of being obliterated, are the very things which are made use of, as with the spring and wheels and hands and face of a watch, to render the integration the more complete. It is not a process which in nature's workshop has to wait till differentiation is finished before it can be entered upon, but one which is going on side by side with it all the time; things like the bones of the human body, which are differentiated from each other, being integrated as a skeleton, and that in turn becoming a differentiation from the muscles and nerves, and then with all the other parts, a member of the body as a whole. And though the process as yet is very far from being everywhere finished, though we have wolves and

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tigers and nations and churches and social classes separated widely from each other with hatreds, rivalries, persecutions, tariffs and wars, we do already have some things, as the solar system, the human body, the family and to some extent the world's business, in which it has proceeded a long way, and these are prophecies of what the whole universe, even its religions, are destined at last to become.

What, now, is the use of integration? What the purpose it fulfills in the economy of nature? The answer, so far as its finite forms are concerned, is plain enough. It is the same as that with regard to differentiation, only more so, greater efficiency in getting food and doing work. It is commonly laid down as an indisputable axiom that the whole cannot be greater than the sum of its parts, or a society have any virtue above what is in its individual members; but, however true in mathematics and metaphysics, it is utterly false as regards evolution. Heap the parts of a watch together forever, and, no matter how well made they may be as parts, they will never keep time. Coördinate them as an integrated whole, and they will run on parallel with the sun itself. Add the members of the human body one to another, and you do not get even a live animal; organize them in their relations and you get a loving,

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thinking, aspiring man. And when all the myriad parts of this vast universe are thus put organically together, its races, nations, religions, trades, professions, parties, pleasures, pains, suns and stars, keeping time like the watch, and animated with one spirit like the body, who shall say what it will not be capable of, for God and man?

It is a stage of evolution which suggests inevitably the natural and divine ideal of church unity, not the bringing of all men into one creed, one ritual, one polity, but the bringing of them, with all their diversities just as they now are, many members, into one body, animated with one spirit. Religion has tried long enough the making of them into one belief. Henry Ward Beecher, going on the platform to make an antislavery speech during the dark days before the war, was met by a proslavery mob who, the moment he opened his mouth, began to hiss him down. Waiting with a smile till they had to stop to take breath, he managed to slip in the words, "You remind me of my grandfather," when instantly there was a hush of curiosity to hear how. "My grandfather," said he, "was a blacksmith, and I am sorry to say not a very good blacksmith. But one day he thought he would make a broad-ax. So he got a piece of steel on which, after heat-

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ing it at the forge, he hammered and hammered; but somehow the more he hammered the less it looked like a broad-ax. Then he thought 'I'll make it a common ax.' So he heated it and hammered and hammered again, and as he did so, the less and less it looked like a common ax. Then he thought, 'Well, I'll make it a hatchet,' and once more he heated and hammered, but with the same result. Then he got mad, and heating it white hot he plunged it into a tub of water exclaiming: 'Well there's one thing I can do at any rate, I can make a plaguey good hiss,'" a story which secured Mr. Beecher a most amiable and attentive audience. Well, that is exactly the way grandfather church used to work at making religious unity. It could take a heretic and heat him and try to hammer him first into a broad-ax saint, then into a common ax one, then into a hatchet one, and then it would get mad and heat him up in an *auto-da-fé* and plunge him down into hell where at any rate, it could make with him a plaguey good hiss. But in either case it was very poor blacksmithing. Evolution's way is to take every man exactly as he is, and make the best of him possible along his own line, feeling that a good heretic is better in the kingdom of heaven than to make a good hiss with him down

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in the kingdom of hell, and then to integrate them all somewhere into religion's great spiritual universe. Who shall say it is not the way along which the whole of nature points the finger?

Such are the three great stages of evolution, homogeneity, differentiation and integration, oneness, divergence, and, on a higher plane, oneness again. What flower ever had a more beautiful unfolding, what poem a plot where one thing opened more logically into another than this flower of the universe, this poem of all things? It is not indeed an unbroken progress. It has its degeneracies and dissolutions; has its long periods of apparent going backward. But as a whole it is immeasurable growth; shows in the large that through the ages one increasing purpose runs. It is like the Bible. It opens with a book of Genesis, and gives us the long wandering in the wilderness, the dividing up of the promised land, the bloody reign of judges and kings, and the horror of the imprecatory Psalms; but it gives us, also, the long line of nature's prophets, the coming of the Son of Man, and the vision of the New Jerusalem.

IV

THE PROOFS OF ORGANIC EVOLUTION

You remember the old classic story of how Ulysses after the siege of Troy and his long wanderings in many lands, proved himself on his return home to be the rightful lord of Ithaca and the yet-alive husband of its beautiful queen. Arriving home at a time when Penelope, believing him to be dead, and worn out with a crowd of imperious suitors, had promised her hand, as a means of getting rid of them, to the one who would bend his bow and shoot an arrow through a line of twelve rings, he appeared among them at the trial scene disguised as a beggar, and when their pretentious hands, one after another, had failed even to bend the stubborn arch, being allowed amid much opposition and ridicule to try what he could do, the apparent beggar having carefully felt over the weapon to make sure of its condition and selected one arrow from a quiver the others of which were left for his rivals' hearts,

"Now sitting as he was, the cord he drew,
Thro' every ringlet levelling his view,
Then notched the shaft, released and gave it wing;
The whizzing arrow vanished from the string,
Sang on direct and threaded every ring,"

showing him to be the true master by a deed
which he alone of all on earth was able to do.

The story is a good illustration of how evolution coming to man after its part in nature's great struggle for existence and long journeys through the material universe, proves itself to be the rightful lord of philosophy, and properly entitled to the world's belief. Appearing in the lowly garb of matter among the pompous systems of theology and metaphysics, it has been allowed, only with much opposition and amid endless sneers, to try its hand at that mighty cosmic problem in dealing with which they have all so signally failed; and now lo, the great master having carefully with the hand of science felt all over its segment of matter and cord of force to learn its condition, "draws the bow and draws with ease," sending its arrow of explanation through all the myriad rings which nature has set up from circling atom and planet's orb and Milky Way ellipse on to the farthest rounds of duty, life and soul.

Compare it in this respect with some of the

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other most noted claimants to the hand of faith. Metaphysics for ages has been laboring at nature's Penelopean test. What wrenchings of intellect, what mazes of logic, what platforms of *a priori* reasoning, what arrays of great names,—Plato, Aristotle, Kant, Hegel, Fichte, Spinoza, Descartes, Carlyle, Comte,—have been brought to bear on its solution, and yet how empty their result. The genial Dr. Oliver Wendell Holmes tells the story that having got the notion in the early days of anæsthetics that the subjective mind, when under their influence, might have marvels revealed to it, if they could only be retained, far beyond the reach of any ordinary intellect, made arrangements on taking his first dose of ether, to write down as soon as he should come to consciousness, before it could be lost, whatever the mighty revelation might be. Inhaling the gas with this in mind, as his vision closed to all earthly things the veil of eternity seemed to be lifted, and the one great truth which underlies all human experiences, concentrates in itself all wisdom and solves all the problems of the universe, and which all the philosophers of the ages had sought in vain, seemed to stand out clear and distinct before his mind, and, with returning consciousness, staggering to his feet, he hastened to secure in black and white the

precious all-embracing sentence. And what do you suppose it was? It read thus: "A strong smell of turpentine prevails throughout." And that is about the result of the labors of the metaphysicians down through all the ages, in getting at the secret of the universe: "A strong smell of turpentine prevails throughout."

Another set of claimants are those of theology. One of them is the doctrine that its Almighty Creator spoke it into being all at once just as it was six thousand years ago, took an armful of preexisting nothing and said over it, Let there be a universe, and immediately, without any secondary agencies, a universe there was. At the close of a lecture on the geology of the Pacific Coast given in Portland, Oregon, several years ago, and illustrated with a series of fossil bones, indicating the vast age of the earth, an invitation was extended the audience to come up on the platform and inspect the specimens close at hand. Near me was an old Presbyterian elder, as much a fossil as any of the dead ones out of the rocks, "Oh," said he contemptuously, as we stood before the miocene remains of the ancestor of the horse, the mesohippus, dug up from a thousand feet below our present soil—"Oh, the absurdity of a man's allowing his religious faith

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to be disturbed by these old bones! They were created by the Lord where they were a thousand years ago, exactly as the Bible tells us; it was just as easy for him, when he spoke, to create dead bones under the earth as live ones on its surface." I told the lecturer afterwards of the remark, to which he laughingly replied: "Poor old man; he might as well go to the graveyard yonder, where he will go soon, and say that the Lord created all the bones there just as they are, instead of their being live ones first, as to say it of those in the rocks." And so he might. It is the method of magic. It belongs to the world of the Arabian Nights, not that of Christian days, to the platform of legerdemain rather than to that of nature. Nobody ever saw it done, even on the smallest scale. If the Bible teaches it, which it hardly does, it was not a matter evidently of which the writer could have had any personal knowledge. And with it embodied in persons like that old Presbyterian elder, is it any wonder that the Penelope of faith should have regarded it as hardly a fit suitor for her hand and heart? Another theological claimant is that of the universe's divine manufacture, taking its eternally preexistent raw material and putting it together part by part, as a carpenter does a house. It is the

theory of it which Milton so graphically describes in "Paradise Lost." He took

"The golden compasses to circumscribe
This universe and all created things.
One foot he centered, and the other turned
Round through the vast profundity obscure
Till earth self-balanced on her center hung."

And when he came to its living creatures, he is thought to have made out of the dust the first pair of each species full grown and complete.

"The grassy clods now calved and half appeared
The tawny lion pawing to get free
His hinder parts, then springs as burst from bonds
And rampant shakes his brindled mane."

It is a picture so ludicrous that it is wonderful how men like Agassiz and Cuvier and Linneus and others familiar with the ordinary processes of nature could ever believe in it as true to life. Nobody ever saw the faintest inkling of such a thing in the real world. And while the doctrine of it as having occurred "once on a time," like the stories we tell children, may do well enough for the long bow of fiction, it can hardly be regarded as deserving a place in the solid one of fact.

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Turning now to evolution as a theory of the universe, it is to be noticed that the proofs with which it begins, the first rings it puts its arrow of explanation through are not those of a far-off nebula,—but of close-at-hand, every-day objects. There are multitudes of things all around us—indeed the woods and sea and land are full of them—in which we can see its whole process going on directly before our eyes. The plant comes out of a seed, and that seed from some other, and so on as far back as we have any knowledge of plants at all, each as the result of its own inherent force and law. The grassy plains do not now calve, but the animals themselves, and their ancestors, and so on generation after generation up the steeps of time. When the boy becomes a man, it is not by having the boy die out of him and a man created and put in his place, but by the natural unfolding of boyhood into manhood. And when we wake up in the morning and see a world around us different in some of its aspects from any we have ever seen before, no one, not even a Presbyterian elder, is so simple as to think that sometime during the night it was spoken into existence by the Almighty just as it is,—pantaloons, watch, primitive fields and himself, or that it did otherwise than unfold naturally out of what

the world was on all its preceding days. Such facts as these are of immense significance. They show that evolution is not a mere philosophical theory of the scholar, but an actual working process of nature itself, something which is in part true at any rate; and with everything in our sight going on now under its law, it is at least a fair presumption that things always and everywhere have been done in the same way.

But, while it is undeniable that individuals and things right around us originate thus from their predecessors, it is said that even with such a starting point, the presumption is too great that worlds and life and species and especially man with his body, mind, and soul, all so different from each other and those we have actual knowledge of, could have originated in that way, or otherwise than directly from the Deity's own creative hand. It is here that the struggle against evolution is most fiercely carried on. Even with regard to such things, however, though we cannot see the whole process going on, as we can with the others, there are a multitude of equally solid facts acting with the presumption that we can see equally all around us, and it is on these, as on the measured base line from which the surveyor gets the dimensions of a mountain peak he can-

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not bodily climb to, that the evolutionist plants himself to get his knowledge of origins up the steeps of time which are beyond his visual reach.

First, as regards the origin from a common stock of the world's different species of animals and plants, we have right before our eyes the beginnings of such a process. Every mother who has had two children, has had two varieties of human beings who, along with their resemblances, have differed somewhat from her, and the father, and from each other in features, temper, talent, taste,—almost every quality of body, mind and soul; has had, therefore, two incipient species. Every orchard and farm-yard is filled with like illustrations of what nature is continually doing to originate differences out of the same stock, even within the limits of a single generation. And though the differences may be very slight at the start, as with railroads running from the same depot, nevertheless how wide they will become even within the limits of history, the old Bible story of the two nations which sprang from the twins, Esau and Jacob, is evidence,—enough, surely, when the diverging began, some of it, millions of years before history, to account for the world's present myriad diverse species.

Then, wide apart as the existing species

may be at their extremes, man and monad, for instance, there is between them a regular series of connecting links and especially of structural resemblances,—homologies, as they are called, which make it as easy as going upstairs, for the one to have arisen from the ancestors of the other. As Emerson prophetically wrote,

“A subtle chain of countless rings
The next unto the farthest brings,
And striving to be man, the worm
Mounts up through all the spires of form.”

They all alike, whether animals or vegetables, are endowed with the same great mystery of life,—all alike are born and eat and reproduce and grow old and die. Lordly man shares his backbone and heart and muscles and brain with the pig, the monkey, the lizard and the fish. Creatures as wide apart as the whale, the quadruped and the bird, have either rudimentally or fully developed their double lungs and four limbs and warm blood; and even in the realms of mind and soul, fear, hate, love, curiosity and conscience, rising to their climax in humanity, rest their base on the brute. Not creation, but modification is everywhere Nature’s law. When wings are wanted for a bird, she does not make them outright, but, like a thrifty

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woman with a last year's bonnet, refashions them out of an old reptile's forelegs; or even a place in which to hold a human brain, she does not build a fresh skull, but, like a wise mother with a growing girl, simply lets out the tucks from the top of a monkey's backbone. Ladies would be surprised to know what some of the most apparently distinctive charms they are so proud of are vamped over from, in the anatomy of their despised lower relatives. The rounded cheeks of children thought to aline them with cherubs, and so conspicuous in Raphael's pictures, are really a connecting link between them and a species of ape, where they are used as the places in which to stuff food. And, with so many known cases in which the organs of one species are made from those of another, how direct the inference that species themselves are but the varied outgrowths of one primitive protoplasmic life.

It is an inference derived from surface facts, which is confirmed most strikingly by the deeper ones of paleontology. The rocks of the earth are a mighty, many-paged volume in which are printed and pictured, by the animals and plants themselves, a history of their growth into species, genera, orders, and the like, beginning, as under evolution ought to be the case, with those which were the most simple

and protoplasmic, and branching out as we go up, like the limbs of a tree, into those which are on the page that is being written to-day. A few years ago, while a party of scientists were exploring the ruins of ancient Nineveh, they came across a brick on which was the print of a dog's foot, evidently made there three thousand years before by his stepping on it when the soft clay was laid out in the sun to dry, another brick very possibly being thrown at him for his mischief. Since then vast empires have risen, and kings and statesmen and warriors and scholars without number have written their names on the scroll of fame only to have how many of them fade into oblivion; the mighty Nineveh itself has risen to glory and perished; but what a satire on human renown;—the mark made by that little dog remains a memorial of himself as clear-cut to-day as when he signed it in that far-off age. So when nature was building this great city that we call earth, her animals were continually treading on its soft clay, or getting their whole bodies entombed in its mud; and what ages, what empires, what religions they have survived, to tell us, as no logic could, evolution's splendid truth. The Connecticut Valley is full of such prints, varying in their length from one inch to eighteen, and in their stride, from

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half a foot to three yards. When I was in college, they had just been investigated by President Hitchcock, and were thought by him to be those of birds and classified as such. But other geologists doubted. The sandstone belonged to a period that was too early for birds. Moreover, it was found that some of them had left the marks of tails dragged behind them, a most remarkable thing for animals which had no such appendage. So the controversy ran high; and it was never settled till Darwin's "Origin of Species" was published, when it was found that both sides were right, the tracks having been made just as some of the old reptiles were evolving into birds, and possessed, therefore, some of the characteristics of each, reptilian tails and avian feet,—a splendid instance of how one higher truth will often reconcile the contradictions of two opposing half truths. The rocks are crammed with such connecting links, branches of life's tree, separate above ground which underneath unite in ever fewer and fewer limbs; and though some needed ones are yet missing, new ones are being found every year, and enough already exist to make a chain capable by itself alone of holding up the whole truth of Darwinian evolution.

It is not in the rocks alone, however, with

their dead forms that we find such a chain, but also in the animal nature itself, a similar one made up of living links, that upholds the same great truth. It is a most interesting and astounding fact that each individual of a species including even man, repeats hastily in its own growth, some before birth and some afterwards, a series of all the forms along its own line that are below it in the scale of being. Nature seems to believe very strongly in reviews, and so, at the beginning of each new term of her school, makes the pupil spend the first weeks before taking up any new studies, in running over everything from a, b, c, up, that as advance work she had been ages upon. The simplest and probably the earliest form of life that appeared on earth, was a single protoplasmic cell, and it is as such that every creature, Socrates and Shakespeare, amœba and ascidium makes his start to-day. Organization begins now, as doubtless it did at first, with the folding over of a layer of cells into a minute sac, the gastræa stage, and it is in such a sac that every child of nature's school above the cell, no matter where he is going to graduate, has for awhile to carry his luncheon, his eye-glasses and also his brains. It is a fishy story, but not less a scientifically true one, that all vertebrates, no matter how much they after-

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wards live on the land and dread the water, even the small boy, pass through an embryonic period of having gills and being able to live only in a fluid environment. Each of the upper classes, however select the society it is going to confine itself to after birth, not excepting a college fraternity, has its time of being only a reptile and amphibian. And if an examination is made at the age of four weeks, not even the smartest scientific committeeman can find any difference in form or faculty between a bird, a dog, a tortoise and a man. The lower animals when they come to their species, graduate out into the world, that is, are born, but those which are destined for a higher rank, like the pupils in a college, keep on through the upper grades, and even after they are born take a sort of resident graduate course, during which some of the topmost stages are passed through. It is such ones that we do not have to go into any ghastly dissecting room to see, but that are beautifully visible in the great living-room of nature. I was in a lady's parlor a while ago, where on the center table was a glass basin in which a tadpole was evolving from a fish into a frog, as refined and nice as the unfolding of a bud into a flower. Who has not watched with wonder the blossoming of a lowly worm into

one of those winged flowers we call butterflies? There are good scientific reasons for the epithet so often applied to the small boy, "You little monkey," that being exactly the post embryonic stage at which he has arrived; and every mother who holds in her arms a child, holds there a little animal that she is to see continue right along the process that was begun before birth, and stage by stage unfold through the puppy, the tiger, the ape and the savage up at last into the man.

What does all this mean,—what its cause? Why, it is simply a phase of heredity, the offspring's inheriting the peculiarities of its ancestry,—there is no other explanation of it; but just as certainly as the unfolding likeness of a child to its parents and its grandparents shows its descent from them, just so certainly its unfolding likeness to the various species of animals one after another, its ontological parents and grandparents, proves its descent from their loins. It is the genealogical table in the great Bible of nature written afresh in each copy by the patriarch species themselves, reaching, less divine, less certain than the genealogical graves, corresponding microscopically with the record there which is written out in full length; and who will say it is less interesting, less divine, less certain than the genea-

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logical tables that we find on the printed Hebrew page?

Nor is this all. Every animal not only passes in its growth through all the stages that its ancestry has passed through, but retains, also, in its own form, remnants here and there of what they were; has in it a living paleontology corresponding with the fossil one that is found in the rocks; splint bones to the horse which are simply shriveled-up toes whose diminishing can be traced right down through five different species; rudimentary teeth and hairs and pelvic bones in whales; suppressed hind legs in snakes; a mingling of the convex and concave vertebrae of reptiles and birds in the old connecting links between them; gill arches in lizards; and in man, over fifty such things, some of them, as the cæcal appendage to the intestines, not only useless, but often of great harm,—now and then, also, single animals that have atavistic marks which belong to others widely different, as horses with zebra stripes, and human beings with the extra fingers and toes of far-off amphibian forms. Who can believe that an Almighty Being making his creatures all at once out of new material would have mixed in them these resemblances of other creatures? Are they not rather the very things we ought to find under the view that the organs of one

species are modified to make those of others,
and not yet wholly shriveled up by disuse?
When a white man was captured by the Indians
in the early wars of our country and carried
off into the wilderness, his way of marking the
trail so that it could be followed, was to leave
behind here and there an old shoe, or a frag-
ment of dress, or the broken branch of a tree;
and pioneer scouts became very skilful in fol-
lowing such trails and capturing the captive
back. And that is what nature has done in her
long journey from monad up to man, she has
left old shoes and bits of dress and broken twigs
at each camp along the way, and evolution adds
to all its other proofs of being on the right
trail, by simply going after her and picking
them up.

When Ulysses made his famous archery con-
test at the court of Ithaca, having once let the
arrow fly from the twanging bow, it had, of
course, to go through all the rings at once
under its single impulse, without any stopping
to be shot again, or let the spectators rest.
But the rings of nature that evolution has to
shoot its arrow through are more than twelve,
and I must leave those which are beyond the
range of species—such as life, mind, society,
religion and the inorganic world, to be tried
for in another lecture. In closing the work

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already attempted, however, let me call attention to the wonderful way in which the proofs reënforce each other and make a united whole. The first consists in showing that throughout the organic world, as it now is, there is a regular gradation of species, both those of animals and plants, from the lowest up to the highest, and multitudes of cases in which the organs of the one are simply modifications of those which are in the others. This is the classification argument. The second consists in showing that the remains of animals and plants found in rocks, constitute, in a general way, a similar series unfolding from the lowest up, ever nearer and nearer, into the ones that we have on earth to-day. This is the paleontological or phylogenetic argument, and, as you see, greatly strengthens the other. But these proofs, though they show the grades, neither of them shows one grade actually producing the other, and so with these alone it might still be said that the Creator simply made the parents of each species a separate pair. To answer this we have the third argument, derived from embryology, showing in the growth of each individual animal a repetition on a small scale, and in a few weeks of the process by which the organic world at large, and through long ages, was produced, and, what is more, showing one

species actually producing that above it which is next in order. This is the ontogenetic argument. And then, binding all the rest together, we have the remnants of organs in the higher species of each series, the living, the geological, and the embryo one, that were of great use in some lower species, but are of no service now. This is the rudimentary argument. The Bible tells us that a threefold cord cannot be broken, but here is a fourfold cord. How could anything be more finely knit together? It is not customary to speak of logic as a thing of beauty. It is ordinarily regarded as incongruous as it was for the medical student to invite his lady-love to go with him not to the theater, but to the most lovely opening of a cadaver that was to come off the same night in the dissecting-room. But if there ever was a real masculine Apollo Belvidere piece of illative grace, is it not the one you have looked at in this survey? And so far as the organic world is concerned, shall we not say that the wielder of its bow and arrow, the Ulysses of evolution, is worthy of having at our hands the Penelope of faith?

V

EVIDENCE OF INORGANIC EVOLUTION

There are doubtless many who have accepted evolution from the start, and to whom all further efforts to prove its truth are as much a work of supererogation as arguments would be to convince them that the sun shines or the earth revolves. But such is very far from being the case with all, even intelligent people. I have before me the report of a sermon recently delivered in Boston, the preacher of which says, "If evolution is true, then the Bible is not true, and God did not make man in his own image holy, and hence man never fell, and Jesus Christ is of no use." There are multitudes of respectable families who still have the old idea that evolution gives them a very much despised ancestry—is a theory liable to explode their human origin, and with which it is just as well not to be caught monkeying.

Most of these disbelievers are encased in such Harveyized steel plates of prejudice, that no proof, even though it came at them with the

force of a sixteen-inch solid, shot from a thirty-foot dynamite gun, would knock into them a conviction,—are like some Protestants in their relation to the Roman Catholic Church; so absolutely sure its adherents are of the Evil One, that if they should get into heaven and find them there, too, they would feel at once, in spite of golden streets and angel songs, that by some awful mistake on the part of the Almighty they had got into the wrong city, and with all possible speed would hurry out of it into the other place.

But there are many others impressed in a general way with its truth, who would like to have their faith in it clarified and strengthened, and would like, especially to have its consistency with their religious belief made plain. As regards those who from the first have been its confirmed adherents, I doubt not, as to me, the whole thing, proof and what is proved, is a grand poem, a majestic hymn of creation, something not merely to be gone through with once and then laid aside, but to be enjoyed over and over a hundred times, each time revealing new meanings between the lines, and each line a new sweetness in itself,

My preceding lecture was devoted to its evidence, as the process by which the different species of the animal and vegetable kingdoms

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were originated from a common homogeneous root.

It seemed best to take up these evidences of organic evolution to start with, because their field is the one in which they are the most conclusive and the most unitedly applied, and because it affords the best vantage-ground from which to go on into more difficult realms. It is a field which is associated forever with the great name of Darwin, and so brilliant was his exposition of it, that to many persons, even now, it is the whole thing, and he its whole discoverer. But, as needs to be emphasized over and over, the organic world with all its importance is only one of its departments, and Darwin with all his greatness, the highest name in only a part of its calendar. Evolution is cosmic, includes all worlds, has as its supreme and earliest expositor the splendid name of Herbert Spencer. Proceeding now to this larger field I shall try to show that its proofs, though more fragmentary in their application, are of the same kind and force as those which are so cogent with respect to Darwinian evolution.

First, as regards the raw material of the inorganic world, there are many curious facts about the chemical elements, so called, which render a common source highly probable. Their atomic weights mount up from the 1 of

hydrogen to the 240 of uranium in a series, each member of which is approximately a multiple of half that of hydrogen, as if somehow the unknown substance to which that half belongs was their one starting point. They do not succeed each other in their chemical qualities, individually, right along from one to sixty-seven, but are divisible into ten or eleven groups, as copper, silver and gold, iron, nickel and cobalt, fluorine, chlorine, bromine and iodine, in each of which the chemical qualities succeed each other regularly for awhile, and then begin with similar ones over again, the groups rising one above another, and the first element in each corresponding in its qualities with all the other firsts, the second with the seconds, and so on. They are like the octaves in music, where after each seven notes there comes the eighth which harmonizes with the first on a new scale,—are like the classes of the animal world where the flying fish, the bat and the bird, though belonging in their homologous structure to entirely different groups, resemble each other in their special wing-like appendages; copper, for instance, being related to silver and gold as one fish is to another, but to iron and fluorine as the flying fish is to the bat and the bird; and very significantly are in the same way like the vibrations of ether,

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which divide its common substance up into the known groups of actinic, light, and heat rays, while the Roentgen ray is most probably one simply of another group,—all indicating that even the raw material of this old world of ours, apparently so full of discord, is set to music; sure, therefore, at last in its completed structure to beat itself into harmony. And that such a rhythmic grouping, so far as its chemical elements are concerned, is not a mere fancy, is shown by the fact that Mendeléeff, who first pointed it out, was able to predict from the vacant places in its tables for which there were then no known elements, that new ones to fill them would eventually be found and what their characteristics would be; a prediction which has already been fulfilled with regard to two of them by the discovery of gallium and germanium each with the very qualities the vacant places required, a discovery in chemistry which parallels that of Neptune in astronomy and those that Cuvier foretold in zoölogy. A large part of the chemist's difficulty in reducing these elements all to a common base, seems to arise from a lack on earth of sufficient heat, just as in the Arctic regions would be the case with steam, water and ice. But in the brighter stars there is no such difficulty, their temperature being vastly above anything that a theologian

ever conceived of as necessary to reduce even sin to holiness; and very singularly the spectrum of the most brilliant orbs shows only one element, hydrogen, while that of the red and parti-colored ones, which are the least hot, shows the other elements in continually increasing numbers, thus suggesting that the same cooling process which is evolving the original cosmic fire-mist into worlds, is evolving out of it the varied chemical elements which later on are to play such an important part in rendering at least some of these worlds fit places for habitation, and in providing for their inhabitants the fit garb of life. So beautiful and far-reaching from the start are nature's laws, so much more wonderful than any magical creation out of nothing, evolution's way of providing nature with even its raw material. And as an indication of what the human mind is capable of, and of the unseen universe in which science not less than religion is at work, it is to be remembered that these marvelous deductions are made by dealing with particles of matter some of which are less than one five-hundred millionth of an inch in diameter, that a cubical box a thousandth of an inch in thickness would contain more than seventy thousand millions of them; that magnified in the proportion of a pea to this whole planet they would

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be only the size of a grape; that they are two hundred thousand times smaller than anything the most powerful microscope ever made has rendered visible; that even if a microscope were invented capable of magnifying them to a visible size, they are moving back and forth so rapidly, some of the gaseous ones at the rate of a mile a second, which thus magnified would be two hundred thousand miles a second, that no human eye could follow them; that even though it could, their nature is so contradictory of everything known about matter in the mass, that when they combine chemically, one so exactly occupies the space of the other as entirely to disappear, as much so as if when a policeman overtook a thief, he should be so completely absorbed by him,—clothes, club, badge and body, there would be only one person left, and he neither policeman nor thief, but possibly the citizen robbed, or the judge on the bench. What need of children's brownies, or of Alice's Wonderland, when evolution as a part of its sober scientific equipment gives us figures and facts such as these?

Passing from the little to the large, we have as regards the evolutionary origin of the earth, the same kind of proof that paleontology affords with regard to that of species. Its

strata not only contain the fossils of animals and plants graded one above another into those which now exist, but the rocks themselves are fossils, fossil worlds graded one above another till their summit is the one which is now a-top. Each of them, so dead, so dark, so buried in eternal silence to-day, was once a realm at the surface, played over by the waters, danced on by the winds, brightened by the sunshine and alive with ten thousand joyous things; each a fulfilment of Emerson's words,

"When the old world is sterile
And the ages are effete,
He will from wrecks and sediment
A finer world complete."

And as we go back through the wrecks and sediment we find their appointments, the same as their inhabitants, growing more and more primitive till they end in one which shows beyond question

"The solid earth whereon we stand
In tracts of fluent heat began."

The first geologists explained its changes as all the result of tremendous convulsions which destroyed one after another its old formations, and opened the way for a supernatural power to come in, and make in each new one all things

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new. Convulsions there were,—earthquake shocks that rent its crust into faults, like that along the Appalachian Mountains, five miles up and down and hundreds of miles in length; volcanic outbursts, like that on the west of the Rocky Mountains which covered what is now whole states with ashes hundreds of feet deep; and elemental battlefields in which the opponents like Milton's angels plucked up crested hills and used them as the missiles of their awful fight. But since the studies of Lyell it has been recognized that the same slow agencies that are at work on the earth now, have also always been at work, and that the two together are fully adequate to account naturally for all geologic changes. Coarse and blundering as the shapers of a world do indeed seem,—the fingers of the earthquake, the volcano, and the glacier and hardly less so those of the frost, the rain, and the air,—no sculptor's chisel or housewife's hands ever left traces of greater skill behind them than they have in carving and ordering the earth. Man has stored up books in libraries, but geologists tell us of long ages before books, during which these blind natural forces stored up the oil by whose light the far-off coming eyes were to read their words. The earth's surface, when it cooled down from its molten state, was richly provided with iron,

but it was in the form of a red oxide so minutely scattered and mixed up with the soil, just as we see it now wherever red earth is, that for man alone to get it out would have made it rarer and costlier than even silver and gold. Its red oxide is insoluble in water, but among the earth's earlier products was a coarse vegetation, which dying and mingling with it in the soil furnished the carbon whose greater affinity for oxygen took away a part of it from the iron, and thus changed it to a black oxide in which condition it is soluble in acidulated water, the oxygenized carbon providing at the same time the needed acid. In this form it was taken up by the rains and floods and carried into ponds and bogs where, away from the carbon, it took back from the air its lost oxygen and became red again, the same thing exactly which now occurs in the purifying of our blood. As a red insoluble oxide it sank to the bottom, becoming thus, instead of scattered particles, a great heap ready, ages after, for man's reduction of it into the metal which has played such a part in human progress, so that the very pen with which the theologian writes his argument against evolution is itself the proof of its reality. The carboniferous forests grew the vegetation whose decay is the base of our enormous coal beds, but their prostrate forms,

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left exposed to the sun and air, would soon have wasted back into their native elements again, had not a great convulsion of the earth sunk them beneath the sea, and there sealed them up air-tight with mud and sand, just as a woman does her summer fruit with wax and glass. Then another convulsion lifted them up for another growth, to be followed in due time with another sinking. Nine times in some places was this process repeated; and now, on nine different shelves in earth's cellar the mighty cans, filled with their precious treasures, stand waiting for human use, all of which beautiful economy is denied and lost sight of by those who in the interest of religion, as they call it, shut their eyes to the evolution they point to, and hold that the whole thing was done at once by a single magic word. What gives the earth its fertility? Not the least of its sources is the loosening and mixing up of soils, begun long before the days of agricultural schools, by the waters and frosts which seemed to be only tearing it to pieces, and about the time of man's appearing on the scene, completed by those huge glacial plows whose glittering shares a thousand feet thick have scratched the proofs of their existence all over our northern bed rocks. Why do nearly all the great mountain chains and continents of the earth run north and

south, thus allowing its torrid and its arctic waters and airs to modify each other and make parts of it habitable that otherwise would be sealed up with perpetual snow? They are gigantic proofs of the far-off time in the earth's evolution when revolving on its axis faster than it does now, and consequently bulging out more at its equator, it was compelled, as it slowed down, and bulged out less, to shrivel up with its ridges lengthwise rather than with them east and west.

So with scores of other things. Geology is the typewriter girl of evolution. The earth's progressive unfolding does not have to be reasoned out: it is written out, written on its own massive tablets of continent-wide stone. The footprints of the advancing eons are just as plainly impressed on its pages as are those of its reptilian birds. If, as Tennyson says, its life

"Was battered by the shocks of doom
To shape and use,"

it was by a doom that was in itself. The modification of old structures into new ones so conspicuous in species, is equally clear in strata. There are rudimental boulders in modern soils which teach the same lesson as rudimental bones in modern animals; aortic

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arches of ancient rivers, as with the Connecticut between Hartford and New Haven, which have been as visibly dried up in the land's passing from its jural to its triassic formations as those of the lizard have in its passing from its fish to its reptile forms; primitive rocks yet at the surface, as, for instance, the granites, which, like the mosses and shells of protozoic time, have survived unchanged all the convulsions of the ages. And, as if to make the whole thing sure beyond any possible doubt, just as we have in every pond amoebas and rhizopods to show us what the animal world started from, so here and there over the earth we have protoplasmic lava streams bursting up from the burning core below, to give us specimens of the very stuff out of which the material earth originally came.

Turning now from stones to stars, their immense distances, their apparent diversity from all that we have on earth, and the absolute impossibility of our ever watching from infancy to age their eon-long growth, would seem to render the getting from them of any evidence as to how they came, an almost hopeless task. They are the very framework of the universe itself, reach in space out into infinity, in age down into eternity,—often reveal their existence only to the telescope's twenty-inch pupil and

the photograph's sensitized retina. Yet even to them evolution has put its question, O ye shining stars, what light of knowledge can you give to man about your birth and growth? O bands of Orion and sweet influences of Pleiades, burning suns and clustered worlds, what truths will you reveal to finite minds as to your laws and forces and your relations to one another and to our own little earth? And the question has been answered by their tongues of light, answered, if not in all its fullness, yet with not a little of that same kind of evidence that we have received from the things of earth.

As regards our solar system, what are the globular shapes of its members, their being all made of matter, all obeying the laws of gravity, all revolving on their axes, and nearly all moving in the same elliptic plane, but the likenesses and homologies which indicate, as they do among animals and plants, that they have had a common parentage, their birth one after another from the same cooling and contracting nebular mist? What, rightly viewed, are, also, their differences in size, satellites, times of revolution, stages of progress, baby Jupiter and old-age moon, reverse rotations of Uranus and Neptune, erratic comets, and multiplied asteroids, facts so often pointed to as proofs of their unlike origin, but the manifestations of

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that variability which is so vital a characteristic of all evolution, and so conspicuous in the animal kingdom,—elephants and microbes, quadrupeds which fly and fishes leaving their watery plane to travel on land. If Nature had deliberately planned to give man an indisputable rudiment of the circular form that, according to evolution, all the planets and satellites have passed through,—had in traversing the wilderness of sky purposely left behind a fragment of her dress, or—shall we say—an ornament of her fingers, so as to enable man the surer to follow her trail, what could she have better chosen for it than those wonderful rings which still sparkle on the planet Saturn nine hundred millions of miles out in the depths of space? And then as regards that integration of differences which is the highest stage of evolution, that divine unity in which each member of the system does his work without jar or friction, where can we find a better example of it than in this shining family of the skies? There is no Venezuela question between Venus and Mercury; no part of the earth, not even England, that wishes to grab anything on Neptune or Uranus. Mars is named after the god of war, but not even any newspaper has ever heard of his being ready for a fight. Jupiter has belts; but the rest of the planets do not have to make

laws against his arranging on their soil for a pugilistic encounter; Saturn rings, but there is not the slightest reason for supposing they have anything to do with political corruption; and the huge, hot-tempered Sun himself, instead of acting the part of a Russian bear to the other members of the planetary alliance, is more like a big bird gathering them all, even the little asteroids, under his warm wings and without any need of fighting off his brother suns, leading them all in safety about his vast stellar yard.

Mounting up with the telescope and the spectroscope into the great sidereal universe, we find that with all its distances and all its differences, it has its points of contact with our own little earth, has its grades which make it easy for evolution, without even a flying leap, to rise from its lowest to its highest point, instead of being that cold, glittering, motionless realm which it often impresses us as being on a winter's night. No buzzing factory, when business is good, was ever more alive with workers than are its majestic rooms with world-weavers and sun-forgers, no woods and meadows in springtime more varied with insects, and birds, and flowers than are its radiant fields with budding planets, bright-winged stars, and many colored suns. Digging into the depths of our

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own earth, we find in its heated core the evidence of a time in its far-off youth when even outwardly it was one of their glowing brotherhood. They are all composed of the same material, only in different stages, that we are, all have at their cores the same hot blood. Gravity is their one law, ether their common light, motion their united life. That same fierce struggle for existence and survival only of the fittest, which are such awful agencies of evolution in our terrestrial woods and fields, are in operation upon all the sidereal heights, world eating world to keep alive, and star starving star to get its needed food. They, too, have their youth, maturity, old age, and time to die. Every summer's night, turning to the southern sky, you can see one of them, Antares in the neck of the Scorpion, going with varied colors through its dying agonies. Ceasing to be sun species, they give birth to planet species. And just as here on earth to-day you can find every grade of animal and plant that the animal and plant kingdoms in their age-long growth have ever known from amœba up to man and from desmid on to daisy, so in the realms of sky, though we cannot go back into eternity and trace their course, we can find as contemporaries of ourselves every grade of stellar and planet life, from the protoplasmic nebula of Orion just

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wriggling into shape, up to sparkling Sirius walking in beauty the winter sky, and from the firefly meteors of earth opening their wings a moment but to die, on to the unsetting Ursa Major bidding the north forever know its place,—every phase that the stellar and planet kingdoms have ever been through, all the steps of one mighty stair-way, all the links of one splendid truth.

This discussion may seem, in some of its aspects, to be only a proof of material evolution of the body, and not the soul of the universe, but is not the seeing of how such a body has been prepared, one of the best ways of rising up to an appreciation of its indwelling soul? "I am thinking after him the thoughts of God," said the astronomer Kepler reverently, as he first came to some of these great stellar truths. And that is what we really have been doing, thinking after him the thoughts of God. And what delving in dusty manuscripts, what wandering in the mazes of theological speculation, what pondering even over the pages of Christian Scripture, could give us thoughts of his which are more truly sublime than this tracing of what he has done from atom to star; what put us in a more reverent mood towards him than this standing for a space in his great temple of the universe? A pious French abbé

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complained to a scientific friend, one day, about the indifference of his flock to sacred things, how in spite of his most careful expositions of Scripture setting forth the wisdom and goodness of Almighty God they would yawn and go to sleep. His friend advised him to drop awhile the written book and preach to them the glories of God out of the great book of nature,—and meeting him the next week, he inquired the result. “Oh, wretch that I am!” exclaimed the priest, “I did as you advised, told them about the size and splendor of the sun and wonder of the stars, and how great he must be who made them all; and alas, alas! they did not indeed go to sleep, but they went to the other extreme: they profaned the house of God by breaking into applause.” That special way of approving what God does is doubtless too Frenchy for us sober Americans to be in danger of its use. But if the light of the stars as they now are can keep men’s bodily eyes awake, how much more ought the light of the process by which their shining came, keep their souls from stupor; and if the wonder of the universe as it reaches through space can throw them into ecstasies of worship, what, in view of the eons of time added to space through which its wonder was unfolded, ought to be their emotions?

VI

THE EVOLUTION OF LIFE

The method of proving the truth of evolution which I have tried to follow in this course of lectures, has been not to begin with the origin of things in a far-off nebula and take them in their chronological order, but to start in with the easy and undeniable ones right around us that we can actually see are the outcome, by natural laws and forces, of their preceding states, and thence pass on gradually to those which are more remote and difficult. "You will admit that two and two make four, won't you?" said the irrespressible village logician to his opponent in the grocery store whom he was trying politically to convert. "No, I won't," replied the man who had experienced at other times the logician's argufying powers, "for if I do, you will lead me on and on with more twos and twos till I have either got to accept your doctrines or deny at last that they make four, and I may as well make a fool of myself by denying it at the beginning as at the end." So

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with the opponents of evolution. Their only safe way is to start in with denying that the two and two of natural laws and forces will make four. With the facts right before their eyes, they are hardly able to be fools as soon as that, and so they wait till they have reached some remoter and obscurer fours, those, perhaps, where a new species of things comes in, before they set up the doctrine that they must be the product of something else than two and two. At the very pleasant tea-table where I was sitting one evening when away from home on an exchange, the minister's wife and sister, both of them the graduates of a high-toned academy, and the latter a teacher in one of our glorious public schools, got into a discussion as to where the moon rose. The minister's wife was sure it rose in the west because she had seen it there over her right shoulder, while the teacher had a glimmering idea that its rising was in the east because somebody's poetry had made it rhyme with yeast. So along with the tea and the toast they mildly argued the matter for some time, and then each politely yielding something to the other, as Christian ladies will, they harmoniously settled down into the agreement that when it is an old moon it rises in the east, but when a new one, in the west, a good illustration of the kind of

truth to which most compromises lead. And so as regards evolution, there are not a few religious teachers and minister's wives' husbands who hold that when things are old and familiar, existing animals and plants and the "fours" of our daily lives, they originate in the natural east and from the twos and twos of an earthly parentage, but that when they are new and strange, as the beginnings of species and worlds and life and soul, they can rise only in the supernatural west and by a miraculous creation. We have seen the evidences, however, that the new moons of species and planets and stars rise exactly where the old ones do, and that so far as material things are conceived, additions to them at the beginning are by the same fundamental rules of arithmetic that they are afterwards. And now I proceed to the reasons for believing that the same is true of those things which transcend matter and which, though close at hand, are more difficult to deal with than Ursa and the Milky Way.

The first of these is life. What is it and whence does it come? We all have it in ourselves; without it could not ask the question, and it is all around us in a myriad other things; has its special marks that we all know; does continually what nothing else can; builds on earth a vast, twofold kingdom, and is the base

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of that intelligence without which all the rest of the universe, splendid as it is, would be only an empty house.

Yet how difficult is its definition even to our thought. Religion calls it on the one hand a breath of the Almighty, and on the other a vapor which appeareth for a little while and then vanisheth away; poetry, "a bubble," "a cheat," "a walking shadow," "a confused noise between two silences." One of the ponderous dictionaries tells us, learnedly, that it is "a state of being alive"; Mr. Mantalini that it is "a demd horrid grind." English pragmatism declares that it is "the sum of the tendencies which resist death," French epigrammatism going to the other extreme, that "it is itself death." Herbert Spencer's famous statement of it as a "definite combination of heterogeneous changes both simultaneous and successive in correspondence with external co-existences and sequences," while setting forth admirably its phenomena, fails to set forth the thing itself; is like speaking of a tree as a definite combination of heterogeneous growings, but without saying what it is that grows; and the simpler definition of it given by Mr. Fiske, as "the internal and external activity of an organism in relation to its environment" shuts out on the one side such things as seeds and

germs which are alive without being active, and includes on the other, such things as steam-engines driving factories, which are active without being alive. And then as to its origin, no eye has ever seen it rising in nature from the world's preceding inorganic state; no experiment in the laboratory succeeded in getting it from what beyond question was otherwise than alive. Sir Wm. Thompson's idea that it might have come to earth on a meteorite exploded from another planet, only puts the question a little further off,—is about as senseless a solution of it as anything that a man of scientific standing ever put forth. And taking these facts all together, and especially the wide remove of its higher qualities from those of matter, it is no wonder that supernaturalists have made it one of their great rallying points as an instance of something which must come from a Being who is outside of natural law and force.

But the two realms with all their separations have here also, as everywhere else in nature, a multitude also of connecting links. There is a Hindoo myth that the gods and Asuras, a race of genii, sat for ages on the shores of the ocean, part on one side and part on the other, churning its waves to bring forth out of them the Amreeta, the waters of life. Eon

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after eon as they churned, the moon and many other strange things appeared, but not the Amreeta. Nevertheless they kept on with their churning, and finally, one day, the stubborn ocean yielded, and the precious, long-desired waters appeared. The genii are the mighty forces of nature; the ocean, the vast sea of nebulous mist. Out of their churning we have seen sun and moon and stars and many other strange things already appear that are heralds and hints of the stranger one which is on its way. Who has ever watched the subtle operations of chemistry, each element selecting its own special material with which to be united, or the wonderful shaping of a crystal, each particle guided naturally to its own place, reproducing from an inner type the parts of it which are broken off, and using sometimes a germ-like particle from another crystal of the same kind with which to get a better start, and not felt he was in the presence of a mystery second only to that of life? Protoplasm, the living raw material out of which all organic forms are made, is composed chemically of the same elements, oxygen, hydrogen, nitrogen and carbon, that are found in a multitude of inorganic things, has had not a few of its higher compounds once supposed to be makable only in the laboratories of life, reproduced equally

well in those of science. Organic growth goes through the same three great stages of homogeneity, differentiation and integration that are the characteristics of inorganic evolution. And though no one has ever seen ordinary matter converted into living matter without the help of life, yet everyone with such help sees it continually done all around him, plants evolving it out of the soil into vegetable matter, and animals out of plants into animal matter. In fact, the very thing which there is so much mystery about in nature is being repeated every day at our tables; particles of matter which are absolutely dead, killed, baked, boiled, roasted, fried and chewed dead, being eaten one hour, and three hours afterwards made alive again and floating in our blood, and of the same protoplasmic substance as that which is afloat in our ponds and is the beginning of all life, a process how analogous to the embryonic repetition of racial growth which takes place later on in all animals, and is so conclusive an argument for the natural origin of species.

Then, as regards the life principle itself which is in the protoplasm and in all living things, and is their really distinctive quality, a large part of the difficulty about its inorganic evolution disappears, if it is conceived of as a

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differentiation and function, not of matter alone, but of that force which is in matter and in all the inorganic world. It has been the custom of some scientists to ridicule the idea of vital force as an exploded superstition; but it is hard to see why. Its recognition simply coördinates it with mechanical force, chemical force, electric force, crystallizing force and the like, as variations, such as nature everywhere else is filled with, of one underlying energy, that energy, it may be, the outflow of the world's eternal, all-pervading spirit; and as crystallizing force, chemical force and the like are not the product of crystals and chemical compounds, but are their producers, so vital force is not the result of vital organizations but is itself the organizer, or, supplementing Spencer's definition, is the agency which carries on "its definite combination of heterogeneous changes." Taken thus, life with its special qualities is simply the mounting up of inorganic force one octave more in that great diatonic scale that we have found in other things, and on which the universe everywhere is apparently arranged. And just as matter in cooling seems to have come to a stage never repeated, in which it was exactly fitted for having matter pass into its different elemental groups, so, later on, it is rea-

sonable to think it came to a condition in which the force that had always been associated with matter was differentiated, just as naturally, from its other groups into that of vital force.

The evidence that its material embodiments, its animal and vegetable kingdoms and its different species, have all originated from its first protoplasmic form, has already been presented; but coming in here as more especially a phase of life, are the evidences of the evolutionary process by which it is continued in its individual possessors, and transmitted from one generation of them to another, and of how it is related to death. In the individual it is by the constant using up the old cells in which it is stored, and the putting in their place of the new ones derived from food. The old Frenchman was at least half right when he defined life as death. The two are not contending foes, as they are sometimes represented as being, but a firm of great coöperating partners, life being possible only by continuous death, and death only by continuous life. Every time we move, every time we think, every time we feel, every time we in any way live, it is only by having some part of us die. In the vegetable world the dead parts are utilized, some to give its trunks and stalks stability, and some to fertilize the soil beneath them

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for other growths; and in the animal world a part to keep the body warm, and a part to go the round of the elements into life again. It is a process which explains why we eat food. It is not merely for the fun of it as some of its eaters seem to think. It is for the same reason that the engineer puts coal into the furnace of a steam-engine, to generate the force by which the functions of life, acting, thinking, feeling, are to be carried on, another reason for believing in vital force; and then, in turn, the hunger for food and the absolute necessity of getting it, become the great driving-wheel that keeps the factory of the big world alive and in operation; so naturally in evolution does one thing arise out of another.

But it is not the cells of the body alone which are used up in living. Little by little the whole body itself grows old and effete, is worn out and dies. That is exactly what death is, life's material used up in living; begins at the cradle, ends only at the grave; can be prevented only in one way, by our not living, merely existing, as sometimes a frog does, sealed up in a rock or tree. While in the army I was sent on one occasion with some dispatches from Roanoke Island across Albemarle Sound to Elizabeth City. Our boat was a miserable little steamer captured from the

foe; and all night, not daring to land anywhere, we struggled against the fierce March wind, again and again nearly going to the bottom. Towards morning our wood and coal gave out, and then to keep the boat in motion we had to begin tearing to pieces its cabin and decks and putting them under the boiler, our last available stick being in embers as slowly and gaspingly we crept up to the wharf. That is how it is with this body of ours in which the soul is sent with dispatches from time to eternity. Battling with the gales of earth, it has to use itself up in getting there and, did it exist as one generation alone, the end would again be universal death. But in anticipation of its fate, while it is yet in its vigor, the same thing takes place with the body as a whole, that all along has been taking place with its single minute cells. It imparts its life to another body endowed with a fresh set of cells. Reproduction, therefore, is simply a differentiation of growth; and what the cell is to the individual, the individual is to the race, is simply a larger cell helping by its being used up and dying to keep humanity alive; so beautifully again does one thing in evolution unfold naturally into another, so wonderfully what under the old theology was the penalty of disobedience and the curse of God,

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becomes under this new revelation the result of obedience and a gift to man of an ever greater blessing.

There are five different ways in which physical life is continued from one generation to another. The first and earliest is that of fission, the one in which a single-celled animal simply divides itself into two parts, the very thing which takes place in all growth; the last and highest, that in which the two sexes blend their lives in a child which is distinct from them both. Looked at superficially, it seems as if the two ways were the exact opposites of each other, the first a division and the last a union of cells, and as if there could be no natural evolution of the one into the other. But Haeckel has shown most conclusively that the other three ways, those of budding, germ buds, and germ cells, are the connecting links between the lowest and the highest, and that even in the highest there is always a repetition of the lowest; that is, a dividing of substance from each of the parents first; and so reproduction becomes in its highest phase simply a continuation of growth, a growth of the race instead of the individual, a growth in which all the oldness and wornness of the parental bodily cells are left behind, and only the freshness and vigor of its new specialized ones, filled

with the deeper inheritable qualities of the parents, are passed on. So easily does Nature grade the way from generation to generation, so wonderfully out of life's old age get forever and forever life's immortal youth, so honestly recompense her children for the pain and loss of growing old and being worn out themselves in her service, by giving them what is more precious than their own lives and what they otherwise would never have known, the joy of having, rearing, and loving those through whom the world's life is to be passed on.

Following life up from its roots has thus brought us, almost unconsciously, into the very midst of another great phase of evolution, that of love. But this in its origin and development is of itself so wonderful and beautiful as to deserve a separate treatment, and reserving its consideration for another lecture, let me round off our thoughts about the evolution of earthly life, by calling attention to its bearing on the great question of an immortal life. If physical life is, on the one hand, the mere result of physical organization, like the movement of a watch of its making, as materialism claims; or, on the other hand, is a gift of God supernaturally breathed into the physical organization as theology has taught,

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then the death of the body, as with the destruction of a watch, may well be regarded as the end of its movement, and the penalty of its sin. But if life is the unfolding of a force which everywhere else in nature is immaterial, and which, as we have seen, can be transferred from one material body to another, and can even make the death of the material body it is in the very means of such continuance, why is it not fair to believe that it can also be continued from a material to a spiritual body, and make death there also the means of its continuance? It is not life anywhere which really dies, but only what life was in. It is a view, to be sure, which makes the final change different in some respects from all the others, but this only renders it so much the more natural. The trunk of the tree continues its life in the limbs, and the limbs in the branches, and the branches in the twigs, and all these are alike in form, but when it comes to the twigs, they transfer it into what? Why, into flowers and fruit, different how widely and how beautifully from all its other forms. So with nature as a whole; it puts its life first into animals and species and races and individuals, all material, but when it comes to the end of individuals, and wants to continue the process, what should we expect the next step to be, but spiritual

bodies, something above matter, the flowering and fruitage of its other forms? And thus we see how naturally and inevitably under the touch of evolution the life which is rooted in sod ripens in soul.

VII

THE EVOLUTION OF LOVE

My preceding lecture in this course was on the evolution of life,—its definition as that interior power of an organism which enables it continually to readjust its inner changes to its outward environment; its probable origin as a differentiation of natural force; its relations with mechanical force, chemical force, electric force, crystallizing force, and the like; the wonderful methods by which it is continued in growth and reproduction from cell to cell and from generation to generation,—itself never dying, but only what it is in;—and the natural possibility of its being continued at last from a material to a spiritual body, and so of immortality's being provided for in the very nature of life and death.

Side by side with the wonder of life itself is the evolution out of it, of that tie which binds its different forms together and which in human beings has reached such heights of beauty and power,—the tie of love. Darwin has shown,

carefully and scientifically, what an immense factor it has been even in the animal and vegetable worlds, for the development of their courage, strength and shapeliness; and in the human world, as revealed to the most casual eye, how wide over camp and court, hovel and throne has been its sway, how mighty its influence. It is no small part of the power which drives the shuttle in that roaring loom of time out of which comes the web of our common daily prosaic lives. Like a vein of gold it runs through all heroism and gallantry, all poetry and romance. It has been one of the great factors of history,—kissed away kingdoms, folded nations in its arms, whispered battles with its breath. Religion has borrowed its language to express the grandest of her own truths,—told us that God is love, and the sum of all duty, loving. It mingles its luster with the great hope of immortality,—makes half of our conception of heaven and more than one-half of its attractions. And the marriage relation in which it finds its consummation, having as its central idea that each person in going out into the world should not be left to fight its battles and bear its burdens alone, but have a helper bound to him by the sweetest of all ties, another self yet different from self, the two nursing each other in sick-

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ness, defending each other in assault, and making for each other a common property and a common home; that out of their union should come a blended continuation of themselves in those dearer than self, and that with passion's flame sobered into friendship's fire, they should walk in its warmth through the chills of age, helpers still to the final home, however short of its ideal it may come practically,—could there be, at least in its conception, a more exquisite device for promoting the world's welfare, and a surer evidence that at the heart of things is somehow Infinite Goodness?

What, now, under evolution, is the source of the agent which has played such a tremendous part in the world's progress, and which is still so precious an element in the world's attainments? Poets have sung it as

"The sacred fyre ykindled from above
Emongst the eternall spheres and lamping sky
And thence poured into men."

And truly if there is anything on earth which in its finer forms would seem to be the direct breath of Deity, anything which at first view it would seem impossible to account for as rising out of protoplasm and dust, it is its "sacred fyre." Evolution, however, finds the same law prevailing here as everywhere else in

nature; first, the lowly germ embedded in a preceding state of things, then the coarse material stalk growing gradually out of it, and then on this stalk the fragrant flower and rich fruit. And though to pass from its sentimental splendors to its scientific source may seem like going up like a rocket and coming down like a stick, nevertheless, I think I can show that the real process is going up as a stick, and then bursting into rocket splendors for which there shall never be any coming down at all.

Going back to its starting point in living creatures, all love has necessarily to begin with self and to take the form of self-love. The only thing a creature can be conscious of at first is its own existence, and, if it is going to live, the only thing that it can care for at the start is the supply of its own wants. To care for a thing, however, is to love it. That is what the word "care" means in Latin, love; and we have the same connection in English through the word dear, a word which on the one side means costly in the way of money and effort; and on the other, beloved, a dear dress and a dear friend. It is a connection which holds true of all love. Care is its food and nurse. The mother loves her child, the husband his wife, the citizen his country, the Christian his church, the soul its God, just in proportion as

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they take care of them and do for them; and the cares of life,—those things of which men so often complain,—without them it would be impossible to have what we all so much rejoice in, its loves. Theologians in the past have identified self-love with sin, have told us that the first thing to be done before we could have any higher love was to crush it out. But this was never the teaching of Jesus. His command was: "Thou shalt love thy neighbor as thyself," recognizing not only that our neighbor is a part of ourselves, but that love to ourselves is the starting point of love to him and is of the same religious quality; and science agrees with him,—shows that love to self is the necessary condition of all life and that without it there could not be anyone either to love or to be loved.

Passing on to its next form, love between the sexes, a large part of its problem is the origin of these two great divisions in the sphere of life, itself one of the most wonderful facts in nature. Of five hundred theories which have been propounded for its explanation, while no one as yet has been freely established, and while food, environment, parental age, time of union and the like, are doubtless all factors, and in the lower animals sometimes apparently overruling factors, the one which lies at the

basis of the others and best explains the equal numbers of the sexes and the subtler and finer differences between them, is the view that the little protoplasmic cell in which life begins, has its two opposite poles, each, like all polarity, with its different characteristics which, when the cell propagates itself by dividing, as we found to be the case in all growth, all reproduction, all continuance of life, become naturally the starting points of two sides, two kinds of living things. As with polarity everywhere else, it is those with the opposite sides which attract each other; and as their possessors increase in size and complexity, the differences in their organizations, as the result of them, become more and more pronounced, developing sometimes in the same individual, as with many plants, and at last, as with the higher animals, always in two, and repeated embryonically in each individual's growth,—these that culminate physically in the two great halves of the human family so like yet different, while the lowly influence which drew them together at first, so akin with what every bit of iron displays, mounts up on the animal side through a myriad lower creatures into the love which is so often their guiding needle on the stormy sea of life, and in the vegetable kingdom, through a myriad plants

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into the orange flowers that are the symbol of their wedded lives. How far the division of that far-off protoplasmic cell in which, according to this view, love began, may account also, atavistically, for the miffs and quarrels and divorces into which, like the zebra stripes on a horse, it ever and anon, even now, breaks forth, evolution can only hint, but it gives a scientific basis for the terms magnetism, attraction, drawn to, and the like, which are used so commonly as the synonyms of love; and it is a good illustration of that oneness, differentiation and oneness again, which are the three great stages of all evolution. Mr. Drummond and other writers have spoken of sex as an anomaly in creation, "a phenomenon which stands absolutely alone in the field of nature,"—as what "has nothing at all like it," and is without a parallel in the world. But this is a groundless assertion. Wherever force is, there is polarity. Every magnet, every blade of grass attracted with its stem up and its root down, every electric cloud swinging through the skies, our whole earth with its north and south poles, every planet swinging through space, every beam of light, nay, possibly the universe itself with gravity at one extreme drawing together, and the opposite of gravity at the other, driving apart, are its analogues. Love

is simply vital force polarized,—is related to chemical force and crystallizing force as the wings of the bird are to those of the fish and the bat, or among the elements, as copper is to iron and fluorine; is the first note in the great octave of life. See, too, how directly and inevitably it grows out of life, the very division by which alone its primal cell can get food and so live, making it a necessity,—how rooted, also, it is through force in the very constitution of the universe itself. We cannot live, nay, we cannot even be, without some form of love. Then the equality of the sexes, not in numbers alone, but in rights and powers,—that, likewise, lies at the very foundations of their existence. Who shall say there is any difference between the polarities in which they both begin? When life's primal protoplasmic cell divided, it divided, as it does now, in the middle, divided equally the common goods. Woman has never given up that original birth-right, never could and never can give it up. When I hear lawyers and politicians talking about their being no natural rights, and that what women or any other human beings are to have, are a gift of legislation and a matter of expediency, I want to send such children for awhile to the primary school of evolution. There are statute books older than those of

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Judea and Rome, commentaries wiser than Blackstone and Kent, epistles more authoritative than those of Paul, legislative halls which antedate those of empires and republics. They began with life, are based on the constitution of the universe; and it is from them that women, and all of us, get our rights.

Notice, also, how closely the scientific account of the way in which sexes originated coördinates itself with the Bible account. The story of the rib has been often ridiculed as the acme of nonsense, but the old Scripture writer was wrong only in the names and details. His Adam's scientific name is Amœba. The rib out of which Eve was made was not bone but protoplasm, and it was Amœba's whole side, not a part of it, out of which she was taken. But the reason for it given by evolution is precisely the same as that of Scripture, that it was not good for Adam, even in his amœbic state, to be alone, and the ultimate purpose was the same as that given by Christianity, that these twain should be again one flesh.

But while thus recognizing the rapture and romance of love between the sexes, and the holiness into which it finally climbs, it is to be recognized, also, that this is not its highest form; their paradise, not its truest heaven; their

intercourse not all which is needed to make man a family and earth a home. The love of the parent for the child, and preëminently the love of the mother for her babe, that is where it takes its richest hues, that where it rises to be the type of what Deity feels, that where it builds the walls and kindles the fires and puts on the roof of a family and a home. Whence does this form of it come? How direct and clear the evidence that this, also, is evolved naturally out of life and, what is more, out of animal life. When the two sexes unite in transmitting life to their offspring, it is a part of each other and of themselves that they transmit, and inevitably, therefore, the love they have for each other and for themselves goes with it, constituting parental love, and as the offspring was first in the form of an egg and then of a babe, they were moved by their love and love's desire to protect its weakness to provide it with some kind of nest. That nest, that shelter,—I never see one now that I do not reverence it,—rough and rude as it was, was the beginning of a long line of abodes whose farther end is the stately mansions of civilization, nay, rather, is that great house of many mansions into which, as offspring of the Eternal Parent, our souls are at last to be gathered. “What makes you call that house your home?”

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asked a gentleman, quizzing a little boy who was just returning from school, "it looks just like the houses where all the other folks live." "Because," replied the boy puzzled for a moment, and then pointing to the window where he caught sight of his mother looking out for him,—"because she lives there!" And there have been myriads of children clad in feathers and fur and unable to express it in articulate words, that have known what theirs was by the same sign.

Then the care and devotion of animal parents to their young; who can fail to recognize in them the beginning, nay, often the full rich growth, of those very qualities which make the wonder of human parental love? When the female monkey brushes away the flies from her sleeping babe, and later applies a stick to the appropriate part of his person to guide him into good behavior, or when the paternal baboon plants himself at the foot of the tree all night, to keep leopards and tigers away from the mother baboon sleeping with her infant child in the branches up above, who shall say that the hair on their bodies makes even a hair's difference between the nature of their affections and that of the human beings who, for their offspring, do the same things? I read, awhile ago, of a gentleman whose land was over-

run with prairie-dogs, and who attempted to drown them out. As he stood watching the proceeding a little prairie-dog mother came rushing back to a hole near him where her young had been left, and diving into it all flooded with water, brought up one of the young ones and laid it at his feet. Returning fearlessly she brought up another, and then a third. A fourth time she went down, but this was too much; she never came up, sacrificing her own life for that of her offspring. The same day, or soon after, I read of a human mother whose house caught on fire, and who rushed in three times to save as many of her little ones, and who going the fourth time perished in the smoke and flame, sacrificing her life for those of her offspring. Did the fact that one did it on four feet, and the other on two make any difference in the love which moved the feet to go? A little King Charles spaniel carried into one of those hells of cruelty which Christianity yet allows vivisection to make on earth,—worse, I sometimes think, than devils ever thought of down below,—gave birth, right in the midst of her being cut up alive, to two puppies; and, forgetful of self, with her breasts severed, her hind legs and back paralyzed, and the unspeakable pain of peritonitis racking every nerve, began at once her care of

them, her last act being to lick with her tongue what with her mangled breasts she could not feed. Which now, if love is indeed a specially human attribute, must we call the real brute, the dog which so died, or the eminent scientist who so inflicted the death? And what are these and the myriad other like stories that the records of the world's lower life are full of, some having their prototypes even in the vegetable world, but proofs that the family tree is all one and that what the human baby finds in its home at the top was branched to, along its growth by baby beast and baby bird!

Sexual and parental love are doubtless the earliest and the deepest-rooted of all love's forms, but they are necessarily limited and narrow in their range, and are very far from showing the whole of its capacities. There is a form of it which goes out wider and farther than any of these, and which takes in at last the whole of the human race, nay, farther still, and takes in all living things; a form of it which is to the love of sex and offspring what gravity is to the attractions of chemistry and cohesion. It is a love which is often thought to be exclusively human, and the product, even in man, of a supernatural religion. The cruelty and antagonism of animals and nations and races to each other, and their mutual

slaughter and struggle for existence as the only way of their living at all, are pointed out as evidence that this love could never have originated out of life, and that hate is their natural condition. And the immense gulf between egoism and altruism, care for self and care for others, the one pulling in one direction and the other the opposite way, is emphasized as too wide for any natural evolution ever to have leaped.

There is no denying these antagonisms as they now are and for ages have been; but going back to where life started, and is ever and ever restarting, we find that the sides of the gulf are so near that even a microscopic cell spans their space. When that first cell divided, it was not out of any hate or rivalry, but because each division in doing so, could get more food, and each was a part of one common self. Later, when parenthood came in and the first child was produced, what was it? Another self, and yet at the same time an extension of the parental self. What the parent did for it, therefore, it did for its own larger self. That is where altruism came into the world. It was a part and parcel of egoism, was a direct outcome of life. And then, when other offspring were produced, what was their relation to each other? Why, that of natural

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brothers. With their multiplied descendants came the swarm, the flock, the herd, the tribe, their members all naturally related to each other. Early association, common tastes, mutual assistance in getting food, and, what is not to be forgotten, even the assaults and antagonisms of other tribes, as their separations became wider and there was need among themselves of closer union; all helped to strengthen in knots, here and there, the tie of a common brotherhood. Among animals it was largely a social instinct, not rising into what is properly love; but even in their ranks instances are not wanting of those altruistic qualities in it, which are foregleams of nature's coming full humanitarian day. What farmer has not seen instances, out in his barnyard, of a genuine Damon and Pythias friendship, among animals, sometimes those of different species, that was simply an enjoyment of each other's company untainted with one particle of self-interest? A rat is not an animal that we very much respect; but when two clear-sighted ones were observed, as was the case awhile ago, leading an old gray blind one carefully down to the water for a drink, what is it but the seed planted in our common life-soil far below humanity, which blossoms at last up above in our civilized blind asylums? There are many

Christian people who think the doctrine of their relationship with monkeys and baboons degrading; but when a mother monkey adopts and cares for a whole group of little orphan monkeys, and a troop of baboons is attacked by dogs and all escape to the hills but a young one which mounts a rock and cries for help, and a stout old baboon heroically comes back, facing the whole pack of hounds, and bears him away in safety, where is there a true mother's or hero's heart that does not instinctively pay its tribute of honor to such deeds as having in them the very accent of altruistic affection? Sometimes the contrast between a brute's conduct to others and that of a human being is very much to the credit of the brute; as in that case out on a Kentucky frontier where two babes, lost out in the woods over night, were found by the searchers the next morning, being nursed along with her own cubs, by a she-bear, which foster-mother they at once shot. Self-sacrifice for others, giving up voluntarily one's own life to save theirs, is justly regarded as the crowning evidence of humanitarian love, but, as a little girl, in a Michigan town, was passing on her way to school through a stretch of forest, she was met by a huge cougar, six or seven feet long, which would undoubtedly have eaten her up,

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had not a small dog, hardly a foot in length, flown to her rescue, being torn to pieces himself, but giving her a chance to escape; an act the more striking because he was not the child's dog, but one which had followed her from the post-office, and so must have done it out of pure regard for her as a human being. And what are all such things—mere specimens of what animal history is full of—but proofs that love in its essence is all one, and that one the direct outcome of life; that what the poet sings in songs and the lover lisps in vows, and the mother feels in babes, and the martyr shows in racks and stakes, are but variations of what the plant blooms with in flowers and fruit, and the animal rises to in nests and lairs; proofs, too, that Jesus was scientifically correct when he said: "Thou shalt love thy neighbor as thyself," recognizing self as the natural and normal starting point of love, or as Pope puts it

"Self-love but serves the virtuous mind to wake,
As the small pebble stirs the peaceful lake.
The center moved, a circle straight succeeds;
Another still and still another spreads.
Friend, parent, neighbor first it will embrace,
His country next, and next the human race."

Love is the staple of all novels and is supposed especially to have an affinity for fiction as its garb, but was there a novel ever written so romantic in its rise, so dramatic in its incidents and so wonderful and unexpected in its dénouement, as this story of love itself set forth in sober scientific fact? It is the very child of life; and to get them both not supernaturally from Deity and the spirit world, but naturally from animal and earth, instead of degrading them, as some have thought,—what is it but adding to their might and marvel? To drop them out of heaven were easy and commonplace;—to raise them out of earth, there is wonder, there an act which is worthy of a God. It is an origin which does not drag them down, but lifts their source up, makes dust divine, matter mystery, nature miracle; is a putting a power on this near earth that we once thought was in far-off skies. And with life and love thus bound together at their very birth here in time, who shall say there is any eternity in which they are likely ever to be parted; and with the wonderful progress they have made together in the past, what Hebrew prophet ever uttered promise more inspiring as to the heights they may united rise to, in the eons yet to come?

VIII

THE EVOLUTION OF SOCIETY

The subject of my last lecture was the evolution of love in its various phases out of life,—self-love, sex-love, family-love and race-love; and now, as coming naturally next in order, I take up the evolution of society, a manifestation of life in which the connecting link between its parts, while akin to love, is more directly self-interest, coöperation and companionship.

It is a subject whose importance can hardly be stated in terms which are too strong. Everybody, to be sure, has moods in which he wants to be alone,—ought, now and then, to find in his own thoughts good company,—reaches, perhaps, the climax of his being when he can stand up, and, in all the grand meaning of that little word, can say *I*. There is usually a time, also, in his experience, when the presence of one other person is enough for his happiness, a time when he would very much rather have no one but her around, not even her old father,

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or dear mother, or mischievous young brother, and when he thinks that with her a desert isle would be a sevenfold heaven. And again, there is the possibility of finding for awhile a delightful companionship with nature and natural objects,—

“A pleasure in the pathless woods,
A rapture on the lonely shore,
Society where none intrudes,
By the deep sea and music in its roar.”

But in his deepest nature and his most enduring wants, man is preëminently a social being. Other relations are to him the luxuries,—the moonshine, cake and poetry of life; but society he has to have as the necessities,—the sunlight, the daily bread and the sober prose, of existence. It is only in connection with his fellow creatures that he can rise up into his highest individuality, only by first dwelling in society that he can really enjoy nature. A babe growing to maturity in the woods, grows only to be a mature brute,—never learns even to speak; while a man left, like Enoch Arden, wholly to himself, sinks, even amid the grandest natural surroundings, into abject misery,—exclaims, as Cowper makes Alexander Selkirk,

“O Solitude, where are the charms
That sages have seen in thy face!

Better dwell in the midst of alarms
Than reign in this horrible place."

And in the world at large, it is society alone which has made civilization and progress possible, its millions of common men doing with their differentiation and coöperation what one man, with all their brains and hands heaped together, never could; and its multiplied institutions being the mighty bowl in which the inventions and discoveries of one generation, dipped up from the spring of thought, are handed down, amid the continual deaths of their original holders, in ever-increasing amounts to the generations that are their followers.

It is a subject preëminently which every young person coming now on the stage of action ought to know something about. The great saving hope of mankind hitherto has been theology, the science of man's relations to God and the spirit world. The great saving hope of mankind in our day is sociology, the science of man's relations to his brother-man and to the social world. Nine-tenths of the problems that we all have to meet as we go out into life are social problems. The air is filled with wonderful socialistic schemes for the improvement of man's condition here on earth. All business, all politics, all reform are social matters.

And to act intelligently with reference to any of these interests, everybody needs to know something of the origin, nature and history of the great institution out of which they grow.

What is society? It is made up of individuals, and in the confusion with reference to the subject which once prevailed, it was thought these were all. But a collection of individuals merely, as in a railroad car, around a street fight, or at a ballroom, even though the individuals be those of a university fraternity or a New York's Four Hundred, do not of themselves constitute society any more than a thousand bricks constitute a house. They must have some permanent relations to each other, must be organized, and each contribute something to the common good, in order to have anything of the real distinctive social quality.

Then, secondly, it is not an artificial but a natural organism, is not something which men have intentionally put together as they do a factory or a watch, but is something which has grown up of itself by the action of man's own interior unconscious life force, as the solar system, the earth and the whole animal and vegetable kingdoms have. It is a distinction of the most vital importance, and it is one that Mr. Spencer and the evolution philosophy are to have the credit, if not of first teaching, yet

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at any rate of calling attention to, and making one of the most precious parts of their great system. It was the old idea that society was intentionally and artificially put together, an idea which lies at the basis of Plato's "Republic," and Hobbe's "Leviathan" and Rousseau's famous "Social Contract." It supposes that men were originally only individuals, most of them barbarian individuals, and that once on a time they came together and said, "Go to now, let us unite and be a society," and that from that time henceforth a society there was. A great deal of the same nonsense prevails now. Men confound states with society; think that because they can change politics, they can change principles; because they make the laws of nations they can make those of nature, forgetting how small a part of society the state is. And nearly all the socialistic schemes the world is so full of to-day, Mr. Bellamy's, for instance, are based on the idea that society is like an old house needing only its worn-out structure torn down, and plenty of lumber and carpenter's tools and a modern architect carted to its site, to have a new one in a year or two rise up in its place.

There is no denying that man has the power to coöperate with nature in promoting social growth, but it is only to modify, not remake,

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only as he has power to cultivate and improve the apple-trees and pear-trees of his garden, not cut them down and build new ones with other wood and flowers and fruit; only as he has power to dress and feed and develop his own body obeying its laws, not to take it apart and make it over again, conforming it to a pattern he himself has devised. What we need to recognize is that the social tree is a living organism, that it did not have to wait for philosophers and politicians and legislative halls and dress coats and Easter bonnets to come along before it could appear on earth, but that it began with life itself, and is what can no more be cut down and made over afresh than could the solar system, or the human body, or the whole animal and vegetable kingdoms.

Going back to its origin, when nature's first protoplasmic cells in growing, divided and became two cells,—as we found to be the process in all growth,—while some of them wholly divided and became separate creatures, others clung together as parts of one creature, and gradually differentiated themselves into its various organs and performed its various kinds of work. All organic bodies are really societies of cells, co-operating with each other for the common good. Their food is simply great companies of other

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cells going along in the blood to take the place of the older ones which have been used up. They are free at first, but as soon as they have joined their different organizations, bones, brain, muscles, heart and so on, have as little will of their own as the members have of a labor organization. The social system of the individual physical body is that of an absolute monarchy in which the individual cell life is wholly dominated by the larger common life, each cell going to brain or foot, heart or entrails exactly as it is sent. Ordinarily it is a contented kingdom, each subject by his obedience and coöperation getting more comfort than he could alone, and the whole having the same efficiency, as compared with what its cells acting separately would have, that a disciplined army has in comparison with a mob. But now and then difficulty occurs. Too much work or too little pay or the wrong food is given some of the cells. The dominating life gets idiotic or overbearing, and perhaps a lot of outside bacteria come in as walking delegates and stir up trouble; and then sickness follows. That is what sickness is, the cells of the individual social body getting up a rebellion, going off on a strike. Setting up for themselves an independent life. Usually it is an entirely justifiable proceeding; and the true remedy is not to

introduce scab labor in the shape of medicines, or call out the military in the shape of the surgeon's knife, but simply to do the cells justice by giving them better food, shorter hours of labor and an improved boss-life, a wisdom that might well be imitated in dealing with the workmen of the world's larger social body.

But nature's aim was to make these little condensed monarchial societies only as a preliminary to something else. As they became more developed and began to produce their offspring by the union of sexes, another and higher set of social relations was evolved. The offspring, instead of being joined with each other physically, as the cells are, remained separate individuals, and were joined together by an invisible social tie, first as families, and then as they multiplied and spread out, into swarms, herds, flocks, tribes, nations and races.

The family was thus the beginning of what is properly society, growing, as you see, naturally and inevitably out of increasing life; and the social body differed from the physical body at the start, only in the fact that while the one in growing kept its growing parts physically united, the other in growing kept them physically separate and united only with a spiritual tie. It is a parallelism, as Mr. Spencer

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says, which is not to be pressed too far, but one that in some respects is wonderfully exact. Individuals are simply the cells of the great social body. What are differentiated in the one as bones, brain, muscles, arteries, nerves, viscera and senses, are differentiated in the other as chiefs, classes, occupations, workshops, roads, telegraphs, post-offices, sewers, schoolrooms and churches. As physical growth is accomplished by the division of its cells and clusters of cells, so social growth is accomplished by the enlargement and then division of its individuals and clusters of individuals. Even the physical methods of reproduction by budding, germ-budding and mating, have their social analogues in the planting of colonies, the addition to the state of outlying territories, and the intermingling of different tribes by emigration and conquest. Social life itself is, like physical life, the continual readjustment by its own forces of internal to external relations; is kept up in the social body by the constant using up and dying off of its individual members, as it is in the physical body by the constant using up and dying off of its cell-members. And as regards rebellions and strikes and mobs and anarchies and crimes, what are they but the fevers and sores and consumptions and inflammations and diarrhœas of society, caused by the oppres-

sions, bad foods, poor wages, injustices and ignorances of the social body as a whole, needing therefore, like a sick man, not so much violent medicines and sharp bayonet thrusts, as a more thorough social pathology and a better application of social sanitary laws. But, while recognizing the parallelism in these respects, there is this very important difference between the two, that while the dominating life of the animal body is in it as a whole, the dominating life of the social body is in its parts. Society has no one brain, or stomach or heart, but does its work by the consensus of its many brains, stomachs and hearts. Most important of all, while it is the tendency of the animal organism to lessen the individuality and freedom of the cells and make the perfection of the body its supreme aim, the tendency of the social organism is to increase the individuality and freedom of its members and to make the perfection of its distinct personal parts the supreme thing, yet with man as their center both uniting most wonderfully, even along these contradictory ways, in promoting his individuality.

Viewing society as thus a natural organism differentiated from the physical body and starting as a family, its first function in evolving must evidently have been to provide itself with food, clothing and shelter, articles which

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in its primitive state, both among animals and man, it doubtless gathered direct from nature, and, except with its young, each one wholly for himself alone. But with the increase of itself and other families, there necessarily arose after awhile a competition between them as to which should have the most of what was too little for all, a competition which, sooner or later, led to fights, which fights in their turn, while separating species from species and tribe from tribe, tended to unite more closely, as their only means of success, those that were of the same species and the same tribe. At first all members of the species and tribe would take part in the fight; but among human beings this could not last. The fighters had to have food and weapons to carry on a long war; those which had them most abundantly, as in our Civil War, being most likely to triumph; so a differentiation took place, some remaining at home to gather food and shape weapons, while others went forth to use them in the field. Thus we have the origin of those two great systems, the military and the industrial, which ever since have been such prominent features in all human society, and out of which, as with the exoderm and endoderm of the animal body, all its other organs are found to grow.

At first the tribe was nomadic, exhausting the

food in one locality, and then moving to another, but as industries, wealth and strength increased, it found it desirable and possible to settle down in the better places as permanent abodes where larger houses could be built and stronger defenses put up, so towns and villages arose.

For a long period all property, consisting as it did of weapons and utensils, flocks and herds, which all in common had helped in producing, was by all in common owned and used. But with a fixed abode and more numbers, more industries sprang up, and more property was acquired; one man got a facility for doing one thing and another another; one was industrious and another lazy; and in the end each naturally wanted what was best fitted to his person and his family and into which he had put the most work; so private ownership came in, and with it that difference between the rich and the poor which has become such a conspicuous and, to many, such a terrible feature in society as it is to-day.

With the facility that the skilful and industrious acquired for doing some things better than others, they inevitably accumulated more of some than they needed, and less of others, so they exchanged products and trade was started. At first the trade was only among neighbors,

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but towns, countries, nations were so situated as to produce some things the others lacked; so commerce followed, involving ships, wagons, roads, canals, post-offices, telegraphs,—all that vast network of intercommunication that is the veins, arteries and nerves of the social body in our time; involving, also, on the one side cheating, lying, taxes, tariffs, money, gold-bugs, silverites, and cut-throat competition, and on the other side, still more largely, honesty, acquaintance with other countries, humanitarianism, toleration, free trade, the desire for peace, and leisure for the culture of letters, art and science. At the beginning of society the father as the strongest and wisest, was naturally its leader both in peace and war; but, when he died, his ablest and bravest son would become its chief in war, and when the war was over and he returned a conqueror, its chief also in peace, bringing with him a warrior's method of personal command; thus government arose, and a government which at the start was inevitably despotic. That is what war always means, despotism. You cannot fight battles with town-meetings, or capture forts with ballots; and whenever a nation has an army, down must go the people and up again the potentate. But in the course of time many strong men arose, some in other arts than those

of war, who as counsellors and administrators shared in the government. The people, also, of the little towns and villages got together in town meetings, and the tradesmen of cities in guilds and clubs, and talked over their local interests and made rules for their own especial assemblies. This was a most important step, for town meetings and voluntary unions, so powerless on battlefields, are the very seeds of power in times of peace. So little by little, amid awful scenes of revolution and confusion, monarchies were undermined, and in place of one man's will, government was carried on by the many's law.

While a part of the people increased in virtue, peacefulness and civilization, others lagged behind, kept something of their old vices, violence and savagery. That is what makes evil, the rise, not the fall of humanity; and as a result laws had to be made to punish wrong-doing; and to enforce the laws, society had to inaugurate its police, constables, courts, juries, jails and hangmen.

There are a myriad little matters of social intercourse, however, that law cannot attend to, and these from the very start were regulated by custom, fashion, convenience, good sense and public opinion, and they gave rise eventually to courtesy, manners, politeness, eti-

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quette, all those graces which lubricate life and constitute what is called good society.

Women at first were the mates of the whole tribe alike, and marriage probably came in through capture and purchase, each man feeling he had an exclusive right to what he had dragged at the risk of his life from another tribe, or paid her parents for in pelt and provender. The marriage ring that ladies wear so proudly now, is a remnant of the marriage shackles they wore ages ago, and what to-day are figuratively called marriage bonds were once very literal bindings. Women with their children to bear and bring up, naturally made home their sphere, developing in its quiet those gentler graces and attractions which have been such a power in softening and elevating society; chose their husbands when choice came, because of their strength in giving them protection, while the husbands chose their wives as they could, because of their beauty, which explains why men are so strong and ugly, and women so weak and lovely. But with the days of danger passing away, and women able to go freely out into the world and share in its work, their natural equality will come back, and with their fewer vices than men, the pendulum may swing the other way, and they for awhile be the superior sex in giving society its coming shape.

The evolutions of mind, morals and religion are so unique and important as to deserve special lectures; but let me say briefly that they are very largely social growths. Man's great struggle for existence was the nurse not only of bodily strength, but still more of intellectual keenness and power. So with morals. Men, in order to live together, must have forebearance, fair dealing, self-restraint, and some degree of veracity, self-sacrifice and regard for each other's rights. Morality is simply the law of social health, as hygiene is of bodily health, ever enlarging as society grows more complex, and in the one as in the other, killing off those who disobey its laws, and preserving, as the fittest to survive, those by whom they are kept. And as regards religion, while it began in the individual soul, it has been in its development preëminently a social quality, instituted at a very early date; its special rites and ceremonies dominated the world for ages through fear, blossomed with the brightening centuries here and there into love, and while doing something to shape society, has been in its doctrines, its liberties, its organizations, and its rituals, an outcome how largely of society's own ever-increasing growth.

That the hasty survey thus given of the world's social evolution is not a mere fancy, we

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have many of the same proofs that we do with regard to the evolution of its other parts. Take, for instance, the passage from the society of united cells in the animal body to the society of disunited animals in a flock or herd. There are creatures which ordinarily swim with their parts distinct, like a shoal of minnows, but which, when alarmed and needing to defend themselves, instantly put their parts together and become one large animal, and others which begin their existence as a single organism, and then pass gradually into a full community. What are swarms of bees but little buzzing groups of cells, that without ever being joined together are really, in their motions and controlling spirit, only a single composite animal? What are ant hills and flocks of birds and shoals of fishes but cruder manifestations of the social tie which higher up draws human beings into cities and tribes, a unity of life that Words-worth alludes to in his words:

“The cattle are grazing, their heads never raising,
There are forty feeding as one.”

And even among plants how inevitably do those which are of the same kind group themselves, pines with pines, oaks with oaks; with what soldierly comradeship the serried ranks of the forest lock arms and breast the winter storm;

how socially the groves, those first temples of God, arch their limbs into roofs, and lift their tops into pinnacles, and with their leaves as hymn-books and the breezes as breaths, join in their choral song; how loving the violets and innocents, unable alone to attract their insect fertilizers unite their forces in great patches of color which can not fail of being seen. And even the wicked weeds when they go forth to do their mischief, how well does every farmer know, it is not as single robbers but as great marauding bands that they make their assaults,—all evidences of how thoroughly the socialistic idea is rooted in nature and with what easy steps it rises from cell to soul.

Coming to man, however, it has long been the teaching of theology that his movement has been the other way, that he was placed on earth at first as a civilized being, and that falling first out of Eden into sin, he kept on falling till he landed in utter barbarism and savagery; and indeed apart from theology there is no denying that he has had great and terrible lapses,—not only individuals, but cities, tribes, nations, whole civilizations, Assyria, Egypt, Persia, Greece, Spain. But regarded scientifically, these have been only the rhythmic movements that we find in all progress; are like the aging and death of generations and species; no more

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an indication of what is taking place with the growing part of humanity than the swash of the waves is of how the tide is setting along the ocean's shore. The different grades of society are spread over the earth now, rising regularly from the lowest to the highest, just as the different species of animals and plants are, so that to-day you can see the stone age in Africa and our savage sires socially in the living men of the southern seas. All history sets its shoulders square against the idea that man began as a civilized being and sank through sin into savagery, and plants itself on the side of his gradual rise, every existing civilization, as you trace it back, growing cruder and cruder till it is lost, not in the sunlight of Eden, but in the night of barbarism and superstition. Beyond the age of iron, where written history finds man and begins his record, the implements that are found in caves and gravels and mounds and shell heaps and at the bottom of Swiss lakes tell in their written words of a bronze age, and back of that of a smooth-stone age, and back of that of a rough-stone age, where his only tools are such as an intelligent baboon is found now to use. Nor is it in the earth or in old records alone that we find the evidence of his rude primitive state. Just as man's living body has all through it the rudimental and atavistic

organs of the animal bodies from which he came, so our living society has all through it the rudimental and atavistic forms, qualities and actions, that prove equally the savage and even the animal society out of which it has been evolved. When an Ashantee woman wants to be very dressy, she breaks off the twig from a tree and ties it to her back hair,—this and nothing more,—and who shall say that so far as the upper part of her person goes, the fashionably-dressed ballroom belle of civilized America does not touch shoulders with her very closely as—if I may be allowed the word without seeming to make a pun—a missing link. Start a panic in an army, or in a crowded assembly or anywhere that a large company of people are gathered, and see how quickly they will lose their separate individuality of will, thought, and action, and become as much one animal moved by one impulse as ever a swarm of bees or shoal of fishes was. The story is told of a cat who was magically transformed into a fine lady and acted her part so successfully in the most fashionable social circles as to resist all efforts to make her betray her origin, till one day her artful rival dropped a rat on the parlor floor when, instantly springing to the carpet on all fours, she went for it mouth and claw. Who has not seen whole churches apparently

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transformed into angels, and resisting all other allurements into lower traits who have done precisely the same thing when an heretical rat has been let loose in their presence? Everybody who is familiar with a farmyard has noticed how inevitably a brood of chickens, when a strange one has strayed among them, will turn on it and peck it to death or drive it off; and what is it but the very thing that all fashionable circles do when a woman with a strange bonnet comes into their brood; and all conservative men-circles when a crank with a new idea comes into their coop? Put a parcel of boys together free of restraint, even college boys, and see how soon they will be up, or, rather, down, to the embryonic monkey tricks of the social stage through which their ancestry came. Dig down under the present crust of society anywhere, and you will find specimens of its primitive state just as surely as you will in the rocks of its primitive animals,—tigers in Tammany Hall, bulls and bears in Wall Street, the lion's tail in English statesmanship, and the eagle's talons in American oratory. City streets which have at one end churches and schools and homes and the nineteenth century, have at the other superstitions and ignorances and hovels and the dark ages. And indeed what is the church itself but a vast system of social

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paleontology, the fossil remains of the world's past beliefs, rites and ceremonies tufted at the top with a thin growth of fresh and living social activities.

Such has been the evolution of society, such the earmarks it yet carries of the animal and the savage herds from which it has come. You see the new meaning it gives to history, to antiquities and to all existing habits and customs, makes them no longer columns of beads on a string, but rows of letters setting forth wonderful truths. It is a process which is still going on, and going on more rapidly now than ever before. What changes have we seen in it during our own time, slavery wiped out, liberty enlarged, and inventions made and truths discovered that under our very eyes are giving it a new shape. It is something of which we too, individually, are a part, living cells in its mighty body, helping to make it not only what it is, but what it is to be. And seeing how it has been evolved in the past, are we not the better prepared to do our part in helping it on to that day when what is rooted so deep in time and been nourished with such myriad lives, shall bear on its branches what vastly beyond its own perfection is to be its final outcome, the blossoms and fruit of even finer and distinctive individual men and women?

IX

THE WORLD'S COMING BETTER SOCIAL STATE

AS INDICATED BY EVOLUTION

When the schemes and all the systems, kingdoms and republics fall,
Something kindlier, higher, holier, all for each and each for all.

Men in all ages have been discontented with their own times and have delighted in picturing to themselves a better social state. With some, its location has been in the far-off past, a Garden of Eden, and a golden age; with others in the far-off future, a heavenly home and an immortal existence; with yet others in an ideal world independent of any special time or place, a Plato's Republic and a More's Utopia, and with not a few right here on earth in a day soon to dawn, a Christian millennium and a coöperative commonwealth. And while now and then it has been only an object of pleasant thought, no more to be sought for practically than

Spencer's Faerie Land or the gorgeous realms of a sunset sky, it has with multitudes of our race, indeed with all reformers, been their dearest hope, struggled for amid all the agonies of battlefield and martyr fire.

Preëminently is our own age characterized by such dreams and discontent. The splendor of its attainments in wealth, art, science, letters, liberty, rights, almost everything which relates to human welfare, is almost lost sight of in the multitude yet remaining of its povertyes, miseries and wrongs. Literally is it having the old Scripture fulfilled that your sons and daughters shall prophecy, your young men see visions and your old men dream dreams; and alive with its spirit there is hardly a newspaper falling short in its morning supply of scandal and crime, which does not eke out its vacant space with an improved social system, hardly a crank failing to earn a living for himself with the hammer and hoe, who does not work out for the world with his fancy a new scheme of universal financial prosperity.

Nor is it a tendency which even in its wildest manifestations is to be wholly despised. The age which never dreams will never do. All the world's great days of sober fact have had their morning sunrise in some splendid fancy.

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“Dreams in their development have breath,
Are rudiments of the great state to be.”

The very word Christian, now so fondly clung to by those who would maintain the existing social order, meant originally the adherent of a person regarded as especially anointed of God to lead men to a better state of things right here on earth,—is now, in the occasional lapses of its ministers into sympathy with new social movements, only being true to the dreams of its own divinest youth. And the socialistic hope, condemned often as outside of all religion, is really only a fresh outbreak in our day of the world’s old Messianic hope, its visions but new chapters in humanity’s larger, unclosed Apocalypse, and its demands but the modern wording of our old endeared Lord’s Prayer, “Thy kingdom come.”

But while such dreamings all have their use, all help to keep men from settling down into the despairing belief that society as it now is, with its myriad evils, is necessarily a fixture. The great drawback to most of them as social states actually to be worked for, is that they are only dreams, only pictures drawn by the unguided fancy of what for the moment seems desirable, and not forecasts based on a study of society’s own inherent laws and whose realization we can

help nature practically to bring about. There is one truth in the matter which our modern acquaintance with the principles of evolution ought to make us absolutely sure of: it is that there will be and can be no coming better social state which is not the direct outgrowth of the one which is now and here, preëminently no better one which can arise from the present one's mere destruction. The present one is the survival of the fittest from among all the myriad experiments which up to date it has been possible for nature to try,—would result if wiped out and tried again, only in its mere repetition,—has within it as the costly product of all the ages of its growth the germs of the best that man can ever have. And to know what the world's coming one is to be, it is evidently to this present one, to the forces and laws already within it out of which the coming one is to be evolved, that the student must go. Evolution, to be sure, even with such a basis to work from, cannot give us all the details of its coming state, the exact size to which its sleeves will swell and hats arise,—cannot do with the star of empire what the astronomer can with a star of the skies, predict from a part of its orbit the whole of its course, for, aside from the mighty factor of man's free will acting on society as it never does on star, nature itself

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breaks forth ever and anon into great flying leaps of action which are liable, as Tennyson says, to make the future,—

“Something other than the wildest modern guess of you or me.”

But it can give us, if not astronomical predictions, yet weather bureau indications of what in the world’s great to-morrow its social state is likely to be, and it is some of its larger features thus pointed out that I shall try to set forth.

It indicates first that it will be a better state than it is now. Evolution does indeed have its degeneracies and dyings out, its “scarpèd cliff and quarried stone, from which a thousand types are gone,” and the time will surely come when in this world, at least, it will have reached its climax and begin to descend; the time when, as Huxley says, “its fittest forms to survive will be again the mollusc and the moss.” But that climax is yet a long, long ways off. Of the eight great periods which a planet’s life normally passes through, mist, liquid, rock, lower life, human life, dying, being dead and dissolution, each of them lasting millions of years, the earth as yet is only in the early part of the fifth, only when man is at the very beginning of his maturity,—has, therefore,

{ barring the accident of a comet across its path or the assaults of some unusually harmful meteoric bacteria, at least five millions of years before reaching its turning point of old age,— is what, if there were insurance companies which issued policies on stars, as sometime, judging by the way they are now extending their business there may be, would be considered a very good risk. And all this time evolution will mean as a whole the world's growing better, mean even with its degenerations a degenerating forward, and with its dyings out a dying into higher forms of life.

Moreover, it is to be noticed that the special part of the world which is now evolving is its social part. Nature is not doing much in our day at making mountains or continents or seas, or new species of animals or plants or men,— not doing much directly at improving the individual body or bones or even brain. But she is at work now as never before, on the world's social structure, is building up the individual human brick, molded for so many ages out of her original protoplasmic clay into an edifice which does indeed promise to be sky-high,— this fact that Mr. Kidd, among all the thousand and one fallacies of his wonderful book, has strikingly made plain. It is what renders sociology such a fascinating study; social re-

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form such fascinating work. We think sometimes we would like to look back into the eons of the past and see our material earth, its seas and shores and living things actually evolving under nature's plastic touch; but we can, if we will, do better than that,—see our social earth, its grander shores and finer life, visibly taking shape before our eyes; be, if we will, partners with nature in the work. And with this certainty of its ultimate betterness to fall back upon, what though we also see races, nations, institutions, religions, some of them of immeasurable cost and worth, perishing all around us, we need not fear, as some do, that society itself is going to perish, need not fear but that from every fall, the same as with physical nature, it will rise up a fairer spring.

"Grown wiser by the lesson given,
I fear no longer, for I know
That where the share is deepest driven
The best fruits grow."

What will be the nature of society's better coming state? Nearly all dreamers have answered, material, moral, civil perfection, a state in which all the forces of nature will be in harmonious action, all the problems of society satisfactorily solved, all the ten thousand forms of the world's evil utterly eliminated, and all

the races of men freed from anxiety and care, working only as they wish, and healthy, happy and good, or, as Tennyson says,

"All diseases quenched by science, no man halt or deaf or blind,
Stronger ever born of weaker, lustier body, larger mind,—
Every tiger madness muzzled, every serpent passion killed,
Every grim ravine a garden, every blazing desert tilled."

But fascinating as in some respects such a vision is, evolution is very far from pointing to it as one ever likely to be realized. Man's present use of the earth, instead of tending to make it a natural garden, is tending more and more to make it a natural waste,—slashing down its forests, burning up its coal, exhausting its soil, poisoning its airs and letting loose its cyclones and floods. Its big wild beasts may be becoming fewer, but how about its little bacteria? Its new West producing larger crops, but what of its old East? Its machinery doing more and more work, but where is its lessening of our human anxieties and cares? Each new discovery brings with it a new danger,—railroad speed, railroad smash-ups, electric dynamos, electric deaths. Each settle-

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ment of an old problem reveals a dozen bigger ones to take its place, shows ahead of us from each mountain climbed.

"Hills peep o'er hills and alps on alps arise."

While the average length of human life is increasing by preservation of the young, who shall say that Lombroso is mistaken in thinking that its real stock vigor, as shown by its fewer old people, is going the other way? And as regards its moral health, though its temptations and tempters in our modern life may be less outward and crude than of old, what evidence is there that their assaults on it inwardly are any less terrible, or the struggles needed for their resistance any less fierce than when, at the start, its primal Adam and Eve yielded to those of an apple and a snake? No: evolution does not promise to take us forward to an Eden in the future any more than backward to one in the past,—does not promise even to give us a sunshine without a shadow or a crown without a cross.

But it does promise with its unfolding around us of more difficulties, more evils, more problems to be met, to unfold within us more strength and skill for their meeting and more success in winning out of them food, health, happiness, manhood. It is this which has been

its trend all through the past,—not fewer foes and battles, but more victories and spoils; not smaller apples and snakes as the tempters, but stronger Adams and Eves as the resisters; not the earth unmade a wilderness, but the earth out of its very wildernesses made to bloom as Eden never did; not its strata of coal undiminished down below, but its layers of the lightning tapped and mined up above; not man less liable to disease, but man endowed by his very wrestlings against disease with a health such as nature never gave; not society without a hell, but society using its hells to make out of them and make for itself, an ever finer heaven. And everything points to this as its direction still more grandly in the future. Just as a French gardener can already take a bit of pavement, and by the use of his chemical fertilizers make out of it in three years a bit of Paradise, so when this old earth of ours shall have become so dry and desert-like that, left to itself, it would not feed a mouse, science and art are to clasp it as a woman does a sponge, and squeeze out of it harvests such as watered Egypt never waved with; compel Sahara with its own heat to make ice and snow; have around either pole, by reason of its delicious mingling of frigid cold and torrid warmth, hotels and picnics and the summer girl; shut the western cyclone, in-

stead of the western farmer, down in a "dug-out" as a source of electric energy for driving his plow and reaping his wheat; and make man as little afraid of bacteria as he now is of bears, tame them, perhaps as he has the dog and the cow to be his guardians and help his health. And while vaster and vaster problems will continually follow his solution of the old ones, the vaster and vaster strength that he will get from their solving, will make him look back on those which to-day are so puzzling,—the silver question, the tariff question, the adjustment of labor and capital, the management of big cities and big hats, and the like,—very much as the man of sixty now does on his childish wrestlings with a, b, ab, and two and two make four. Meliorism, not optimism, an ever bettering, not an ever best, that is the principle, that the promise of evolution, as regards the world's coming social state.

And after all, is not that what we really want, that the thing which really is best? Who dreads difficulty, toil, sacrifice, agony, when to meet them he has health, muscle, courage, brain,—who, rather, does not welcome them as manhood's truest joy? A perfect world to dwell in would mean to its dwellers inevitably the wasting away through ease, of their long, toil-won powers. It is only imperfection which can

keep alive perfection; only a heaven before us forever unreached, the struggle for which can make a heaven within forever reached; and amid all the frightful pictures theology has painted of a realm where

“Infinite day excludes the night,
And pleasures banish pain.”

“And everlasting spring abides
And never withering flowers,”

it is an immense satisfaction to feel that evolution will never cease, at least in this world, to provide us amply with manhood's meat of sorrow, hardship and care,—great problems to be solved for humanity, and great sacrifices to be made for those we love,—never cease, therefore, to give us a betterness in which souls can grow.

How far will society's coming betterness be a realization of what socialism has in view, a betterness in which all its property will be owned by the state and all its industries,—farms, factories, trade, travel and the like, administered by the state's officials? We all know how largely such a consummation is the ideal of our time, and what thousands not of cranks merely, but of society's best men and women are working for it as the one remedy including all others, for the waste, inequality, rivalry and

wrong with which the world now is so fearfully cursed. Far be it from me to utter one word of disrespect for their zeal, or of denial as to the really strong arguments urged for their plan. But whatever else may be said in its favor, looked at in the light of evolution and through the long vista of history, it is an ideal whose realization for the future is utterly hopeless, one as regards which the movement is all the other way. There are three great stages in all evolution, whether it be of worlds, plants, animals, or society, homogeneity, or sameness; that in which everything is in common, as a nebula, a seed, an animalcule; then differentiation or diversifying, that in which the common mass is divided, subdivided and divided again into a multitude of distinct parts, as with planets, the limbs of a tree and the organs of the human body; and finally integration or organization, that in which the parts while still remaining as distinct as ever in their own forms and functions, are joined by their common life principle in a large and complex whole which is capable of functions infinitely beyond what either the original mass or the divided parts could accomplish, as the solar system, the fruit-growing tree and the marvelous human body. Now society, like everything else, began in homogeneity, or sameness, began with having

lands, dwellings, wives, children, rights, religion, everything, owned and held in common by the family and the tribe, and administered for it by the father and the chief. And it was then, beyond question, its most desirable state, survived for ages variously modified as the fittest in which to withstand foes and secure food, lifted man from savagery to Greek and Roman civilization,—is what Puritanism sought to reëstablish here in America, and has its illustrations to-day religiously, alike its excellencies and its defects, in the great Roman Catholic Church.

But it is now most emphatically a back number in the issues of time, has left far behind it the environment which of old made it a success; and to go back to it would be like the limbed tree's going back to its common trunk, or the starred universe to its undivided fire-mist. Evolution is not traveling at all that way. The rise of humanity has been the rise of the individual; freedom, that ideal for which such battles have been fought, such rivers of blood poured out, such heroisms of earth's noblest and best displayed, has been freedom first of the state, and then freedom just as certainly from the state; commercial progress, the growth of property into private hands away more and more from legislative interference,

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and Mosaism, Christianity, Protestantism, Liberalism, religion's great steps, each a step forward in the soul's throwing off some community's shackles to stand forth and give an account of itself before God. And with this mighty law of evolution within it, where now is the probability that society's movement is to be reversed, and its differentiations rolled back, even partially, into the homogeneity out of which they have been so long and so painfully evolved? Where the likelihood that humanity after struggling five thousand years to get its neck out of the yoke of a sovereign person, is going to put it right away into the yoke of a sovereign state?

What though the property thus massed away from the individual is still to be owned by the community of which the individual is a part? That will not make his real control of it any more than when formerly it was owned by a chief or a king. An old New Hampshire farmer tried to celebrate his Fourth of July one year by going on board a magnificent warship at anchor off of Charlestown Navy Yard, and making himself very much at home, inspecting its guns, engines, cabins, compasses and the like. An officer, on beholding the intruder, peremptorily ordered him ashore. "I won't go," said the old man, "I am an American

citizen, I'd have you know; and helped pay for this 'ere boat, and it is as much mine as it is yours." "All right," answered the officer, picking up a sliver from the deck and handing it to him, "here is your part of it; take it and begone." Well, that sliver represents just about the control the American citizen would have of his property after he had lumped it all into a great ship of state.

What though the officers who control its affairs are to be chosen by the officers themselves? That is not going to make their individual liberty under them any greater than it was when their rulers were imposed upon them by blood and birth. Jim, the New York soldier, who was so outrageously strung up by the thumbs a few years ago, helped to choose his officers, yet when he attempted to express his opinion as a freeman, wherein was he better off than the subject of a czar? The people of the United States choose their lawmakers as things are now; yet who, looking at the kind of wisdom they display at Washington from winter to winter, can wish to put any more of his interests into such hands? Changing the name of a government, calling it a fraternity instead of paternalism, is not going to change its nature. Wherever the political carcass is, there will the political eagles be gathered to-

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gether; and a family in which an elder brother is given the rule is not likely to be any more acceptably abused than one in which the accustomed father holds the rod.

No, while the parts of the people who have special axes to grind, may be as ready as ever to bring them to the public grindstone, it can hardly be said that those who have to do its turning,—and some of us farmers' boys, who used to have to turn the stone about mowing time know what that is,—are likely to be very much pleased with such an enormous addition to their work. It is honest men, not rascals, who to-day are getting a distrust of politician-made justice,—honest men who, seeing how law has left its seat in the bosom of God, where old Hooker beheld it, to take one on the bench of a lobby, is woven by a congress only to be riven by a court, has narrow meshes for the poor workman's cart and obsequious gates for the big corporation's coach,—they who are relying more and more on themselves, independent of law, for conducting their business. And anarchism,—not the anarchism of dynamite and disorder, but the anarchism of Jesus and Paul, each man's doing right without rulers from a principle within because it is right,—though such a terrible word now, as liberty was once,

is destined, like liberty, to be a mighty word and an honored one in the years to come.

But, while State socialism, that is, the owning and managing of things by the State and its officers, is thus hopeless under evolution, there is another kind of socialism, that of voluntary individual association, the integration of society's differentiated parts not by outward authority, but through their own inherent law, into grand organic wholes, which, as being in the very line of all evolution,—its third great stage following naturally after that of differentiation,—is sure more and more to come about. State socialism says union is a good thing, and therefore all men *shall* unite; nature socialism says union is a good thing and therefore all men *will* unite—two little words, but having between them all the difference there is between despotism and liberty. Society is going to take nature's way,—has already begun it,—indeed has been walking in it from the very start side by side with its making men individually free. The age in which we live is preëminently one of voluntary individual associations, people joining hands to do things themselves, instead of kneeling at the feet of a prince, or, worse still, of a politician to get them done. Who will say it

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is not the manlier way? And its use is to go on with increasing ratio, the State always, perhaps, doing some things, those which experience shows it can do best, but becoming at last only one of ten thousand voluntary associations. And under the action of these two great forces, differentiation and integration, the one giving man the priceless boon of individual liberty, the other the equally priceless efficiency of coöperative labor, the world's great social solar system of its coming age is to swing forth along its starry way.

But, excluding thus the idea of property's being owned and managed by the State, the question yet further arises, what are to be its distributions in private hands, and what especially between those of labor and capital? It is a question of tremendous significance. The differentiations of wealth in our day have passed all former bounds,—are heaped upon one side in multiplied millions, hollowed out on the other in multiplied miseries. The struggles for it between labor and capital are rivaling in cost and ferocity the world's old military wars. "What!" exclaimed an African chief to the traveler Burton, "do you think I am going to starve when my sister has children she can sell?" There are business chiefs, not in Africa, who with equal indignation are ex-

claiming, "Do you think I am going to submit to a starvation ten per cent. of profit, when my sister Labor has children by the sale of whose toil into what is practical slavery, I can make twenty!" And with this process of differentiation still going on, fortunes becoming larger and larger as the result of natural law, and corporations more and more arrogant as the result of human law, it is no wonder that to many persons the outlook ahead seems desperate and dark. What has evolution to say of the matter?

It says first of all, do not scare,—that huge fortunes are not unmixed evils; that a million dollars honestly gained means in its very gaining a million dollars' worth of service to the world, and after its gaining a million-dollar mountain from which copious streams of spending are bound inevitably to flow down into the plains; and that so far as they are evils, dishonestly gained, they will of themselves fail to survive. Evolution has had big things to deal with before; has seen the animal monsters of the geologic ages superseded so entirely by lesser ones, that man's real danger to-day is from those which are too minute for eyes to see; seen the emperors and kings, principalities and powers of the political world go down again and again before the plain common

people; and it has at least two of its great forces already at work which are sure, in due time, to bring about a similar result in the financial world, with its property monsters and capital kings. One of them is the transfer of its struggle for existence, or, in other words, its fierce competitions, from the ranks of labor to those of capital by the popular education of more persons into the capacity for using capital. It is the excess of laborers now notoriously which keeps down their wages, the scarcity of capitalists which makes their enormous gains possible. Equalize their numbers by equalizing their ability, make brains as common as brawn and you equalize their rewards. The school-book, this is the best lever, if labor would but see it, for lifting up wages,—the slate-pencil, this is the best bludgeon, if labor would but use it, for knocking down scabs; and instead of lamenting and resisting the increase of capitalists, as it now does, it ought to rejoice in every one which goes up among them from its own ranks as a helper transferred to the very citadel of its foes. Evolution's other force helping along the same result is the union of labor with itself, the matching of millions of money with millions of men, the solid shot of capital with the Gatling gun of toil. It is a weapon which

has proved effective everywhere else in the struggle for existence of the weak against the strong, for it was not good old Dr. Gatling down at Hartford, but Nature herself who was its original inventor,—used it ages before man on her awful geological battlefields where, when her monsters got too large, she not only pitted them against each other individually, but assailed them with whole flocks and herds acting together, six hundred a minute of her smaller creatures; and it is one which labor can rely upon with equal certainty of success in its battle against the dinosaurs and megatheriums of capital.

But this is not all. Evolution here, as everywhere else, means beyond war peace, beyond division a finer union. A husband and wife who had invited to dinner a gentleman friend recently divorced, had with them at the table their little son, a regular *enfant terrible* full of embarrassing questions sure to pop out in the most embarrassing places. He had doubtless overheard a little of his parents' talk about the divorce, and with the first lull in the conversation, fixing his eyes on the "marriage-is-a-failure" victim, demanded of him, "Where is your wife?" Trusting to quiet him with one straightforward statement the gentleman answered "Divorced." Instantly the question

followed, "What did you get divorced for?" With a flushed face the unhappy wretch seeing that he was in for it, explained that all married people were not as congenial as his happy father and mother were, and that temper had made the difficulty. "Well," he continued, before his horrified parents, who hitherto had enjoyed the fun, especially the compliment to themselves, could choke him off, "what made you get divorced for that? Why didn't you do as pa and ma do, when they get their tempers up, stick together and fight it out?" Well, that is exactly what labor and capital are going to do under evolution. Instead of getting divorced as the result of their disagreements, they are going to do as pa and ma did, stick together, not as master and servant, but as husband and wife, and fight it out. Labor will always exist and always be labor,—the golden age have dust on its floors and dirt in its streets, the millennium its shining robes to be washed and its white horses to be groomed. But there is no reason why labor, because it deals with dirt and coarseness and brutes, should itself be dirty and coarse and brutal. A large part of its degradation in the past has come from the old theological doctrine that the matter it deals with is in its very nature degraded and vile. But science has in our

day, thank Heaven, utterly rid it of that slander, has shown it to be as beautiful in its laws, as wonderful in its nature and as immanent all through with Deity as spirit is. The worker in it, as it is now revealed, even in its lowest dust; the greasy mechanic and the despised mudsill; touches grandeur, stands face to face with mystery, has that to deal with which challenges his loftiest powers and is capable of drawing out his noblest qualities. Filth! What form of it has matter ever assumed, even in its lowest sewer, so utterly repulsive as that which has been revealed again and again as existing at the very heart of European culture, something which must be vile indeed when it is too vile for even a modern newspaper to make money on. If we are to have dirt at all, give it to us, I say, in the blackened hands and stained dress that are on the outside of manly toil rather than in the blackened tastes and smudged souls which are inside of fashion's dainty dress and æstheticism's whitened skin, the honest dirt of the cabbage's root rather than the nameless nastiness of the sunflower's gaudy disk. And with matter thus raised to honor by science, there is no reason why the worker in it should not be raised to an equal level,—be paid as much wages, eat as good food, wear as good clothes, go into as good society,

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and have at church as broad-aisled a pew as the worker does in business of mind or soul.

Capital also, will always exist, can no more be got rid of by labor than the mill pond can by the stream. And making labor an equal, it will find in it, as every husband does in his wife, a helper who, beyond any servant, will save him enough more and make him enough happier to pay tenfold over for all its extra cost.

Then, as society evolves, may we not fairly look forward to a time when they both will estimate wealth and reward in something else than dollars and cents; to a time when knowledge will be gain, and art and science riches, and inward growth income; to a day when newspapers will speak of millionaire souls and of deeds registered in heaven as really treasures, and when at a man's death his character will be counted as well as his cash in reporting what he was worth? And will not this be a solution of the property problem infinitely better than any mere equalized distribution of its silver and gold?

I have time left only to speak briefly of the other great elements which are to enter into the world's coming social state, piety, morals, brotherhood, womanhood, nationality and the like, what they are to be. Evolution affords

no indication that society's separations on these points are ever, as some hope, to be closed up, and all men be of the same tastes, caliber, political opinion and religious faith,—tends, rather, to accentuate their existing divisions. There will always be farmers, mechanics, merchants, lawyers and possibly—though their chance seems poorest of all—even ministers; always radicals and conservatives, believers and skeptics, saints and sinners, Mikes and Bridgets, Sir Galahads and Lady Clara Vere de Veres. But evolution does indicate the coming of a time when out of their separations, here, the same as everywhere else, its other principle of integration shall arise, under which all harsh feeling between them shall pass away, and an organic union take its place, in which their very differences shall be each other's help. Mr. Kidd has shown conclusively that it is only those people who have the most fraternity, morality and public spirit with which to hold themselves together and hold in themselves each generation's slow increment of progress, that in the world's fierce struggle for existence can survive; these qualities, therefore, which are sure to become more and more prominent in the world's coming state. Pride and scorn and class airs will be lessened. Bridget will always get a smile in the street from Lady

Clara, and Mike a bow from Sir Galahad. Protestants and Catholics shake hands together instead of fists; Democrats and Republicans tell truths about each other instead of lies. "You can't whip me now, father, for I am sitting down on the spot," exclaimed the small boy to his irate approaching sire. So even Robt. Ingersoll shall have his spot to sit down upon, safe from the pulpit father's theological lash. Marriage, like everything else, shall have less law in it and more love—not begin in courtship and end in courts, as too often it does now, but have the fixedness of freedom and the oneness not of the oak and the vine, but of the two-celled heart. Each sex, completely developed along its own line, "full summed in all its powers," man ever manlier and woman ever more a woman, shall lay aside more and more its outward ferocities and foibles, he his "swelled head," and she her "swell" hat; and society in rising up into the splendors of its new morning and singing the sweetness of its new song, will find that it must have them both acting everywhere together as its two wings on which to soar; and, to make all the sweetness of its song, the gifts of each set to those of the other

"Like perfect music into noble words."

While nations, also, so far as feature, custom, character and capacity go, will always remain distinct members of the world's great social structure. Nature has not spent such countless ages and such outpourings of blood, treasure and hate in evolving them as separate peoples only to end in resolving them all back again into one conglomerate humanity. But differentiation here, as everywhere else in evolution, will be followed by an integration of the parts that will utilize their very diversities in building out of them a grand organic unity which each people by keeping alive its special entity will render the more complete. Nationality, as we know it now, bristling with bayonets and centered in self, is but a passing phase in humanity's growth; patriotism as it is to-day, fed on battle memories and beautiful with an outward red, white, and blue, but a single petal in the flower of a people's love. All harsh barriers between nations shall in the world's better day be broken down. Armies shall be turned into embassies, forts into gateways, tariffs into wastebaskets. Boy brigades and military drills shall die out even from our Sunday-schools; and the difficulties between great peoples—as difficulties doubtless there will always be—will be settled not as now by the barbarian fisticuffs of war, but in the

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parliament of man, the federation of the world. There was a time in the far-off geologic ages when the highest organization on this earth was a worm, a series of animated segments outwardly linked together as one animal, but each with its own circulating motor and nervous systems and each in all, but its outward form a distinct existence. Then after long ages a creature appeared of the amphioxus type, having a faint thread-like nerve running lengthwise through the segments and uniting them in a common life system. It was a step forward, that bit of notochord, which was second in importance only to the appearance on the planet of life itself, was the beginning of a backbone and a brain and of all the marvels of vertebrate existence; and it has gone on from species to species till now, in place of a segmented worm crawling the earth as its highest product, we have articulated man walking the planet as its master, and unfolded mind walking the universe as friend of its Maker. Society with its different nations strung together in segments over the earth, outwardly one humanity, but each with its separate economic, military and governing systems, was all through its great historic ages only at the worm stage of its development. In 1858 a slender telegraphic wire was laid across the

sea connecting two of these segments, England and America, together. That wire was the evolution of humanity's notochord, that the beginning of society's amphioxus stage. It is to go on with the race, as it has with the individual, bringing its parts into ever closer relations. And what man, with his body, mind and soul, is now to the segmented worm, that the vertebrated, vasculated, brain-governed humanity of the future is to be to even the mightiest nations of the past.

Friends, the subject I have thus imperfectly discussed, is not simply a refined philosophical speculation, but a matter of transcendent practical value. Human beings were meant to be not mere idle lookers-on in this part of nature's work,—not mere passive blocks waiting to be built by other hands into the coming social state, but live helpers in its doing, or as the old Bible puts it, laborers together with God. And to give this help wisely and well they evidently must know something of what nature's plans are, see something of what nature is aiming to bring about. "John," said a dying woman to her fond husband, "you have always eaten the crusts at our table yourself, haven't you?" "Yes," answered John, "I always have." "John," she continued, "you have always eaten them because you wanted to

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save me from doing so, haven't you?" "Yes," replied John tenderly, "that is why I have." "John," she gasped out with her final breath, "I always liked crusts myself," leaving John the double sorrow of having sacrificed himself all his life on the altar of eating crusts, and sacrificed her on the same altar of having no crusts to eat. How many are the reformers eating the crusts at Nature's table their whole lives long, when it is in her own stomach they are really wanted,—how many the cross-bearers, who, if they only knew her real likings, might help things along a great deal better by eating its soft parts themselves! Rightly understood, I do not know of anything in all the ranges of thought hardly excepting religion itself, which is so practical, so hopeful, so inspiring as the evolutionist's faith, anything which amid all its struggles for life and overshadowings of death, has before it so sure a future for alike great and small as the evolutionist's work. During our last war with England, a large frigate sent out to convoy a fleet of merchantmen from one port to another on the Atlantic coast was overtaken just at night by a terrific storm and had hardly time to signal its charge what course to take and what rendezvous to seek, when the darkness fell

and shut them all from each other's sight. The frigate itself ably manned, after battling three days with the gale, succeeded just as night was again descending, in reaching the appointed port. But where was its convoy? Not one of them was to be seen, and it can well be imagined with what an anxious heart the captain lay down to his needed rest. But how great was his joy, when rising early the next morning he beheld a score of them lying at anchor all around him, their long, tapering masts lifted up to heaven as if in silent thanks, and at the harbor's mouth through the mist all the others borne in on the ocean's mighty flood tide, the smallest, dullest sailor of the fleet, one they had feared would never even in the sunshine reach any port, bringing up the rear. The frigate's instructions had not been in vain. So with evolution set to convoy all the myriad interests of earth from the port of the past to the haven of the world's better coming state. The storms and convulsions of time's sea and the awful night of the grave may indeed fall upon them and drive them wide apart,—make it look sometimes as if all were to be lost. But signaled by their convoy what course to take, and each doing its own best, they, too, shall weather all their storms, survive all their

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nights, and borne along by nature's mighty flood tide, flood not for six hours merely, but for six millions of years, reach at last, even the slowest, dullest sailor of them all, the port of the World's Coming Better Social State.

X

HOW EVOLUTION IS RELATED TO RELIGION

Evolution buried for ages as a fruitless seed in the dust of scholastic books, and then on its first springing up in the fields of modern science, ridiculed and denounced as a "mere dirt philosophy," has become suddenly, in our time, the pet word of society, winning to itself in a single generation the adherence, with hardly an exception, of all scientific thinkers, the homage of newspapers and reviews, and the respect even of pupils and theological schools. It is a popularity, to be sure, for which it has had to pay the penalty of being often vulgarized and misapplied,—made a sort of *Trilby* in the shops of thought; and as a consequence some of its more sensitive disciples are shrinking back a little from its use. But there is no cheapening of its name which can really cheapen the thing itself. It is the grandest philosophical generalization the human mind has ever yet reached, the statement of a law which runs through everything in nature from

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the making of a sod to the making of a soul, the revelation of a tie which gives unity to all things in time just as gravity does to all things in space. And though it is not yet by any means a completed system, though it has many missing links to be supplied, and many vast realms to be explored, its main principles are settled beyond dispute, and transcending all our ages' other magnificent achievements, its discovery bids fair to be the one supreme thing which is to make the nineteenth century memorable forever in the annals of thought.

Evolution, however, is not only a grand philosophical theory, but is even more a great practical truth, one which affects the aspect of every object of the universe man has to deal with, and it has changed the point of view from which the whole universe is seen. There are some beholding the change, who are exclaiming with horror that "we are all adrift"; some who, refusing to recognize it, are going right on with their work as its objects appeared to them at the old creation standpoint, and some, ministers, alas, who, while recognizing their new position, think the only safe way is to mix up the two views, look at nature and natural science from the standpoint of evolution, and at ethics and religion from that of creation, and who, accordingly, are depicting the Bible,

Jesus, Christianity and man as having at the same time a natural and a supernatural origin. It is an impossible combination; the true course is to lay aside reverently every mental conclusion which is vitiated by being drawn from the philosophy of the past, keeping only the ripened skill which has come from its study, and redraw the picture from this standpoint of the world's new thought.

Preëminently is such a change needed in drawing our religious conclusions. God, man, society, soul, universe, are indeed the same in themselves as of old, and the light we are to see them by is that same divine Light that from the dawn of faith lighteth every man who cometh into the world. But their perspective, their relations to each other and to the eye which sees them, and the parts of them on which the light falls,—these are widely different. Their supernatural sides and ends, often the only ones visible from the old creation standpoint, have disappeared; their natural ones, as never before, come into view. And henceforth, therefore, if we are to have intellectually any complete and consistent setting forth of religion, it must inevitably be the one which comes from the study and use of this philosophy.

Evolution is of necessity very closely related to religion; is not only a new point of view

from which to look at religious objects, but a new way into the very heart of the thing itself.

All religions have had a cosmogony,—the Hebrew Bible begins with one;—all have had to be mixed up with some kind of dirt philosophy. For the first thing to attract man's attention, as it evolves into consciousness, is this wonderful material world in which he finds himself placed; the first things to excite his awe and adoration, the majesty and marvel of it he is everywhere surrounded with. Whence did it come? What is the power which keeps it moving? How can man adjust himself to its power so as to get its help and avoid its harm? These are questions he has to ask, these the ones which bring him face to face with religion. The creation answer gives him an outside maker, the evolution answer a maker within. And while a person may study a manufactured article, a house or a world, and never come into very close connection with the being who put it together, he cannot study an evolving one, a flower, a man or a universe, and not feel that to know it all through, root and all and all in all, he must, as with Tennyson's flower in the crannied wall, know what God is, know something of its indwelling originating power.

Under the doctrine, also, that everything in the universe is the outgrowth, by natural laws and forces, of its own preceding state, religion, as a thing of the universe, has to be recognized as such a growth; a plant which somehow must have had its seed, a species which somewhere must have had its origin; and evolution, therefore, to be thoroughgoing, must show what its seed was, investigate the species out of which it originated, study its environment and its inner laws and forces, and, in short, do by it as it does with all other growing things.

Especially does it have a close connection with the study not only of religion, but of religions. It is impossible to know any one of them by knowing that one alone. They must be classified and compared and their relationships with each other traced out, that is, the principles of evolution applied to their investigation. It is the lack of such a guide which has led theologians to place the Old Testament as an authority on the same level as the New; mix together in their conceptions of Deity the attributes of the Jewish Jehovah and the Christian "Our Father"; go back to the literal words of Jesus and his apostles for their statement of what Christianity is; coördinate as brothers and sisters, religions whose real relationship was that of parent and child, uncle

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and nephew; and even in their definition of religion seek for some element that was common alike to its fetich seed and its full-grown civilized tree. It is only the study of how they have been evolved which can show their true connection. Liberality will be placed by it on a solid scientific foundation, and while intensifying the faith of its disciples in their highest form, will show that for its age and environment even their lowest was the survival of the fittest. Equally close is its connection with religion on its humanitarian and ethical side. To be sure of man's brotherhood we must know something of his fatherhood. To deal rightly with his divisions of race, and with their hatreds, wars and persecutions they must be studied in the light of nature's own principle of differentiation. The wide contrasts between the moral principles in savage and in civilized lands can be understood only by taking into account their wide contrasts of environment. And in all man's practical religious work for the bettering of himself and society, with evolution still going on in the world, the only way in which he can hope to succeed is not to act at cross purposes with it, but to fall in with its trend; conform to its laws and principles; show himself and what he is aiming for, the fittest to survive; to do which he evi-

dently must know what its trend and its laws and forces are.

Finally, if there is to be a future world for the human race, it must be the outcome in some way of this present world. And its outcome how? Why, in precisely the same way that this present is the outcome of those which are past, by its evolving through natural laws and forces from its preceding earthly estate. And this means that its beginnings, its promise, its evidence are now and here. The process of its evolution may well be, as it has been with the present one many times in the past, by the origin of a new species of world as different from our terrestrial one as the oak is from the acorn, or the grown animal from its protoplasmic cell. But the acorn, the cell, the preceding estate, not the less are to-day in our streets, in our churches, in our homes, in ourselves; have in them the promise and the potency of all its splendor, all its fineness, all its eternity; are what a perfected knowledge of evolution would enable us now to see. And it is along such lines, not fanciful and far-fetched, but logical and scientific, that this "dirt philosophy" is related to what is humanity's fairest hope and religion's crowning truth.

From dust to Deity, from cell to sainthood, from monad to morals, the roots of the tree of

life in the mist of the universe's primal nebula, —that is its scope. It is not indeed a story of unbroken progress, or of an altogether dressed up Sunday-clothes goodness. It has its dark and bloody chapters, its myriads of "red-with-ravin" actors, its long pages of degeneracy and dissolution, and its agencies that no one would think of setting up in a modern pulpit as those of the Christian ideal. But taken as a whole, what poem ever had a more epic grandeur, what history a clearer evidence that through the ages one increasing purpose runs, what gospel along with its Gethsemane and Calvary the proclamation of a richer good news? As a religious revelation it is of the same order as our printed Bible. It opens with a book of Genesis, and gives us the long bondage of its children in the world's Egypt, the weary wanderings of their feet in the wilderness of nature, the fierce battles they had to fight for civilization's promised land, the bloody reigns of their judges and kings, and the horror of their imprecatory Psalms. But it gives also the rugged grandeur of Sinai's laws, the long line of nature's prophets, foretelling ever a better day, the coming on earth in due time of the son of man, the acts of a myriad apostles, and the vision at last of a New Jerusalem and a tree of everlasting life.

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And reading it with the same reverence that we give to the printed page, we shall find, I think, that the word of evolution coming through the lips of science, not less than the word of Scripture coming through saint and sage, is the word of God.

XI

DOES EVOLUTION NECESSITATE A FIRST CAUSE?

The existence of the natural world with its grandeur and beauty, its marvel of life and its myriad apparent instances of intelligent design, has been regarded by the religious mind in all ages as one of its strong arguments for the existence behind it of a divine originating Cause. As every house has its builder, and every watch its maker, so, it has been reasoned, this great house of nature, this mighty succession of events, a little of whose time-element the watch is meant to measure, must have had correspondingly its builder and its maker. And as before the age of machinery, everything which man did he did immediately with his own hand, and each time by a direct act of the will, it was natural to suppose that the divine Cause proceeded in the same way, made the universe at first and everything in it as fast as it appeared by his own direct touch, and as the outcome in each case of his own special volition.

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“God of the earth, the sea, the sky,
 Maker of all above, below,
 Creation lives and moves in thee
 Thy present life thro’ all doth flow.”

It is an argument which modern science from its very birth has tended in some ways greatly to weaken. While enlarging immeasurably man’s conception of the size and wonder of the universe,—and so of the Being from whom it came,—its continual discovery of laws and forces, more and more of them, in nature itself, that are immediately producing the phenomena once ascribed direct to Deity;—as, for instance, gravity, its planetary motions; the unequal heating of the atmosphere, its winds; and the violation of sanitary laws, its diseases;—these things known as secondary causes, have pushed farther and farther out of sight alike the need and the place of a First Cause. Some positions, to be sure, along the way of the arguments’ retreat have been seized and held by the church as necessitating, in their case at least, the direct action of Deity;—among them the first appearance of life on the earth, the coming of man, the rising of ethics and religion, and preëminently the advent of Christ and Christianity,—but their defense all along has been evidently the lack of some more comprehensive natural principle for their explana-

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tion. And now in our time, evolution, the crown of all the sciences, has come on to the field apparently to complete the process, teaching as this very principle that everything in the universe, even life, man and religion, is the outgrowth by natural laws and forces of its own preceding state; that matter itself had within it from the very start the promise and potency of all life; and that what has been thought so long to be design, and the proof, therefore, of a designer, is really only the survival of what natural selection and the struggle for existence have shown to be the fittest for its environment; a theory which "solves by some great force the mystery of things, sees in dead matter both their source and end;" and leaves no more need of a divine Cause to come in among them than there is for a farmer to take the place of nature in giving his cattle their eyes and ears, or his trees their flowers and fruit.

Is this the real inevitable logic of evolution? Must its disciples in accepting it give up the argument for Deity which is based on nature, and give up with it all belief in a divine, intelligent First Cause? It is the awful fear that such must be its outcome which is the secret, beyond question. As Mr. Fiske says, of the violent opposition from the reli-

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gious world with which evolution was received at first;—not so much that it gave man a monkey for an ancestor as that it took away apparently his divine Father, not so much that it made the Scriptures false as that it seemed to rob the universe of its meaning. And under such an impression, it is no wonder it was heard with dismay, for there is no splendor of a truth which can take the place in the human soul of a truth-giver, no enlargement of the house it lives in which can make up to it for the loss of the house's head.

Evolution does indeed have its atheistic, or, at any rate, its agnostic aspects, and it has not been lacking in followers who have accepted them as its real teaching; but there are others who, instead of acknowledging its guilt in this direction, have sought to show that it affords in its own principles a new and strengthened argument for the existence of a First Cause.

One of the ways in which they have done so is by pointing out that it implies of necessity a beginning of things in what has been evolved, and that it never by any possibility could have begun itself. The most formidable objection against the theistic argument hitherto has been the alternative theory that the universe never had any beginning; that it is

self-existent; and that what is going on in it now has been going on forever; an infinite round of summer and winter, birth and death, growth and decay,

"A mighty whirling wheel of strife and stress"

without starting and without stopping,—a theory, it was urged, which is no more inherently difficult than the doctrine of a self-existent creator whose life had been going on forever without a First Cause. And it was an objection that the old natural theology was never able really to meet.

It is one, however, that evolution at first sight does seem fairly to overthrow. For though some evolutionists have claimed that their science is only the description of a process, and has nothing to do with beginnings, such a narrowing of it has no warrant either in its history or in its principles. The very name of Darwin's great work in exposition of its organic field is the "Origin of Species"; and its whole professed object, as Herbert Spencer, Haeckel, Huxley and others of its great expounders, set it forth, is to trace out the law by which everything which now exists, no matter how highly differentiated and integrated it may have become, must have had its starting point in some kind of homogeneity. The fact

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is, it is a necessity, which appears to be involved in the very idea of evolution, the evolution at any rate of any finite thing. Where there is no progress, only a series of changes out of which nothing comes, its changes may indeed have gone on forever without a beginning and continue forever without an end; but the moment you introduce the idea of differentiation, one of the stages as we saw of evolution,—a stage in which the present condition of a thing has been reached by dividing and varying the material that composed its preceding condition, going back to ever simpler and simpler forms,—that moment you bring in the necessity of a beginning. You all remember that old problem in arithmetic which used to be given us in our school days: If a single cent was put to interest at the opening of the Christian era, what would the amount of it be in our day? and how we used to wish that some old ancestor of ours living then, instead of spending all his cents for candy or marbles, had been thoughtful enough to put one of them in the bank for our benefit. But, however large the sum, we now should have had quintillions on quintillions of dollars, enough to have filled not only our globe, but this whole universe; and however far back the interest began, even with that old anthropoid ancestor who had

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a tail and lived in a tree; we all knew it had to begin with that first cent. So with the evolution of all our visible universe itself. Its accumulations are only a question of more intricate interests, only a case in which we have had the very thing done for us that we wished as children; and, enormous as the amount now is, it is equally true that it all had to begin with the putting to interest of that first far-off cent.

But if there must have been thus a beginning to the universe, an accumulation, step by step, of its enormous amount, who, this argument asks, could have been its beginner, who the investor in nature's bank of its first wonderful cent? It could not have been its own beginner. None of us as schoolboys in our wildest wishes ever thought of a cent that on its way to buy candy or marbles at the opening of the Christian era, or at the creation of the world, had stopped at a savings bank and for our benefit put itself to interest. Matter and force, the supposed constituents of the universe's primal homogeneity, or even that still simpler world-stuff out of which even matter and force may have been differentiated,—these, with all the other potencies that materialists have ascribed to them, have never had that, to begin with, of self-determining

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will-power, never the ability to say to each other at some point in eternity, Go to, now, let us evolve a universe,—never the kindly forethought which would prompt them to invest a cent out of their pockets for a little humanity boy, who was to come into existence myriads of ages after their day.

Yet, without such powers, think for a moment how impossible was the world's self-origination. All the laws and properties which were in its matter and force then at the world's beginning, must have been in them always, otherwise, as you see, their state would not have been a beginning; but if in them always, then inasmuch as they could not start themselves, they must have been always in operation; and, if always in operation, then the universe, or at any rate, all that is finite in it, must from all eternity have been along, at least as far as it is now.

Mr. Spencer in his "First Principles" attempts to get rid of this difficulty about the initiatory impulse, by supposing the original nebulous matter of the universe was only partially diffused, and that its forces were in a sort of balanced condition which the slightest disturbance would destroy and set in operation. But the chapter in which he does so, entitled "The Instability of the Homogeneous" is the most

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unsatisfactory of all his works. If the nebulous matter was not universally diffused, it could not have been in a state of homogeneity,—would have had an outside and an inside, and the outside particles, being more acted upon by gravity than those within, it would from all eternity have been evolving, and, being finite, would from all eternity have been evolved.

On the other hand, if the original material was equally diffused through all space, as Kant and Laplace and others have assumed, and at rest, as the friction of its particles would have necessitated, it never by any known natural force,—gravity, cohesive attraction, chemical affinity, or the like,—could have changed its condition. Never by gravity, because being infinitely diffused, each atom would have been equally drawn in every direction; and never by cohesive attraction or chemical affinity because in order to have them act, its atoms must have parted with some of their heat;—impossible again, inasmuch as filling all space, each one would have to receive from the others exactly as much as it gave to them. Thus whatever condition is assumed as the original one, it is inconceivable how the universe with matter and force alone could have had any absolute beginning; the difficulty being as in the case of a

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balky horse, either its starting too soon or else its refusing to start at all.

It is an inconceivability which Haeckel, the most scientific and thoroughgoing of all evolutionists, sees and acknowledges, the only one in all his vast system which he does see and acknowledge. "A great and unsolved difficulty," he says ("History of Creation"), "lies in the fact that the cosmological gas-theory furnishes no starting point at all in explanation of the first impulse which caused the rotatory motion in the gas-filled universe." And it is one also which Mr. Spencer, if not in his chapter on "The Instability of the Homogeneous," yet elsewhere sees and acknowledges.

He says, "The ultimate mystery continues as great as ever; the problem of existence is not solved by evolution; it is simply removed farther back; and those who hold it legitimate to argue from phenomena to noumena may rightly contend that the nebular hypothesis implies a First Cause as much transcending the mechanical God of Paley as his does the fetich of a savage."

The difficulty, it is claimed, is one that the doctrine of an intelligent Will Power at the head of the universe does solve, and is one, therefore, which logically compels his recognition. It is like the weaving of a piece of cloth by a

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human being as compared with its being done by an automatic loom. Both the man and the machine have physically the same mechanical devices and use directly a power which is subject to the same natural laws. But while the machine, the moment it is wound up, has to start the weaving, if it is going to start it at all, and has to go on with it without stopping till the work is all done, thus completing it in a definite time, the man with his power of choice can wait as long as he pleases before setting his loom in motion and can delay as long as he pleases before his cloth is done. So while the universe, if self-evolving, would from all eternity have to be evolved, the universe with volitional First Cause would be a loom whose power-belt could be turned on at any point of time, setting its warp of atoms and molecules, suns and stars leaping up and down, and between them, flying back and forth, its shuttles of heat and cold, life and death, threaded with the mystic woof which hour by hour weaves the world. And the fact that its long web is yet in the process of weaving and has not from all eternity been finished and laid away, is evidence, it is claimed, that it has at its head a great living weaver who chose at some special point of time to apply its power and set it in operation.

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Is the argument sound? At first view it seems to be so,—seems all that even Mr. Spencer admits as to its cogency; and I am free to confess that personally for awhile I rested in its conclusion and rejoiced in evolution, beyond all even of its philosophical beauty, because it was apparently so logically theistic; made nature reveal, afar off, to be sure, yet with intellectual certainty, the existence of its God.

But more careful thought shows alike its inconclusiveness to the mind and its unsatisfactoriness to the heart.

First of all, as regards a divine First Cause, himself, to ascribe to him will-power does not really remove the difficulty of conceiving how he could have willed to begin the universe at any special point of time. Where there is will-power there must be motive to act on it before it can choose, just as certainly as where there is a water-wheel there must be water to make it go; this so far as we can see, as truly in an infinite as in a finite will; and the question inevitably arises as to how in an all-perfect and unchangeable Being there could be a new motive arise. A motive must have an origin as surely as a motion; and to say that a First Cause was moved at its beginning to start the universe, only sets us out in search

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of what was the first cause of that First Cause, and transfers the endless series from the realm of matter to the realm of spirit.

Worse still, it makes matter and force originally separate from the First Cause of the universe and able to exist without him till he was needed to set it in motion; and then, after he had done so, separate from him again, and in no need of his presence; makes the world atheistic, therefore, except at the one single moment of its birth. It differs from that half-way evolution which holds God interfered with the processes of natural law and force at certain special periods, as at the introduction of life, of man, and of religion, only by going a little further back, going to the beginning of the universe instead of going to the beginning of some special part of it; and logically and consistently, if we make him thus a miracle—God at one period, we might just as well allow him to be such at all periods.

Then, as regards the beginning of the universe itself, it really explains nothing;—drives the sceptic as to Deity only into an apparent corner. All the difficulties as to how gravity, cohesive attraction, chemical affinity, and the like, could be kept from acting on a finitely diffused homogeneity, or be made to act on an infinitely diffused one, are exactly as great

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under the supposition of a will-power to set things in motion at first, as under that of their self-beginning. Of course it is easy to say that an Infinite Being with a single word could speak them all out of the way. But this would be resorting to magic to get rid of them instead of natural law; and, if we are going to have a fiat universe at all, we might as well hold with the old theology that Deity spoke it all into being ready-made out of nothing six thousand years ago, as to be to all the trouble of tracing it back over the long, slow path of natural evolution millions of years, and then, even there, have to evoke a divine fiat.

Still further, admitting all that the argument claims as to this present universe's having had a beginning, it does not follow as the only alternative that will-power must have been its beginner. It may be said, and it has been said, that the present universe,—beginning, evolution, and all,—may be only one of an infinite, self-existing series which has been, and is to be, evolved; that the homogeneous elements out of which it started may have been simply the remnants over from the decay of its myriad predecessors, and that the power which enabled it to start may have been merely the rhythmic action of the old indwelling power which made the others decay and which, by the law of the

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conservation of energy, must have been gathered up somewhere; just as a pendulum, when it has swung its full extent one way, comes for a moment to a dead stand, in which its potential and kinetic forces exactly balance each other, after which, without the need of any new touch, but simply by its own inherent weight, it begins to move the other way. Or, instead of the entire universe coming to such a stand at the same time, it may be that like summer and winter on the earth, its evolution and dissolution may alternate from one part of it to the other, the released forces which in one hemisphere have produced its decay, immediately passing into the other to produce its growth.

It is a theory incapable of direct proof, but which does have, it must be acknowledged, a multitude of actual, known phenomena in this present world that analogically are in its favor. Evolution here on earth is everywhere rising by its own inherent laws and forces out of dissolution. Plants, animals, men, nations, civilizations, even religions, are born, grow to maturity, linger a little while, and then decay, only to have others out of their dust do the same. All the indications of science are that the earth itself is at last to fulfill the law it has imposed on such myriads of its children, "Dust

thou art, and unto dust shalt thou return." And looking up, the skies, with all their splendor, have in them already the shadow here and there of their celestial doom,—stars like Antares, dolphins of the upper deep, whose flashing colors are those of expiring suns; globes like the moon that are the dead leaves yet undisolved of their vast stellar woods; and nebulae like those of Pegasus and the Hunting Dogs; whose aspect is best explained as that of vast systems of worlds, equal in size to our Milky Way, which are just ending, rather than just beginning, their lives; all suggesting that what is the round of birth, growth, decay and birth again here on earth, is the law of the universe as a whole. It is a use of its material vastly more in accordance with the economy of nature than to think of it as remaining forever, after its life, a huge corpse filling space;—is the only known way in which the great law of the conservation of energy can be carried out;—the only imaginable way of answering what becomes of those vast tides of ether waves which in the shape of heat, light and actinic force, are sweeping off from every sun and star. And with it recognized as a possibility, it will be seen at once that all the cogency of the argument for a First Cause, that is based on the need of it at the beginning of evolution, is

taken away. What made the homogeneity out of which the universe came, broke it up. Death itself had in it the seeds of life; and as the last expiring moment of December gives birth to the first new moment of January, so, it explains, the last expiring breath of the universe's old order of things may have been the power which started the present one on its course.

Then, after all, it is the failure of an argument, promising as it seemed at first, over which, rightly considered, there is really no reason to mourn. Were it successful, it would have given the inquirer only an attribute of Deity and not Deity himself, only a chronological First Cause and not an always and all-pervading presence. And its want of success only shows that the Eternal is not to be captured like an elephant, by driving him with the weapons of logic into a penned-up corner of the universe; not to be found in the earthquake, the thunder and the whirlwind of a beginning, any more than in the displays of them afterwards; and it gives new significance to the Scripture words, "Spiritual things are to be spiritually discerned."

But leaving this part of the inquiry as fruitless, there is another and grander way

in which evolution does really necessitate the recognition of a First Cause; one, also, which is in harmony with the Scripture dictum as to his spiritual discernment; and that is by its leading to him not merely as the source once of some far-off beginning, but as that out of which and in which now and always all things rise and are. It makes him the First Cause of the universe in the same way that the fountain is the first cause, every moment, of the stream which winds through the valley, and that the sun is the first cause age after age of the light which goes pulsing off into space. Nay, even these connections do not express all the closeness of his evolutionary relation to the sum of things, for the stream after it leaves the fountain, and the light after it leaves the sun are separated in space from their source, but the universal First Cause is not conceived of by evolution as separate even in space from anything to which he gives birth, any more than gravity is separate from a moving planet, or life from a living body; but as continually operative in every atom as that from which it comes,—

“A motion and a spirit that impels
All thinking things, all objects of all thought,
And rolls through all things,”

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a spirit, a Being who wills and loves and works forever the eternal right. Under its reign the old miracles, such as the turning of water into wine, disappear, but the whole world shines forth with the ever new miracle of turning chaos into cosmos; the old Bibles lose their prominence, but all truth becomes his revelation; supernaturalism sets, but atom and star rise up his prophets, flower in the crannied wall and nebula in Orion's belt his apostles. He is made by it, as never before, his own teacher. The truths of transcendentalism join hands with those of sense. He is not merely an occasional visitor to earth, but from its birth out of the fire mist till now its perpetual presence; its matter and force not agents he operates upon from the outside, but parts of himself; the universe everywhere no longer an unconscious machine, run with his hand on its crank, but a live tissue thridded directly with his muscles and nerves and growing, as all live things have to, with a vitalizing force in contact with its every atom. All the poet's raptures over nature; all which even a Wordsworth has sung about

"A sense sublime
Of something far more deeply interfused"

than its outward charms; all the emotions of the religious worshiper in the presence of

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mountain, sea, and midnight sky, are justified by it as scientific realities; and not only those who have the spiritual and poetic vision, but those even who have only the eyes of sense, all who can see anything, can see God. Yet giving thus everything that pantheism ever did, it separates itself, with its recognition of will-power, by a broad impassable line from pantheism as such; is in its essence theism still. It does not solve all the problems about Deity; those about his own mode of being; or how existing from all eternity in connection with matter and force he could have always been what he is without exerting his will upon them; or the relation of evolution to his unchangeableness; or any of those mighty ones Mr. Spencer presents as constituting his unknowableness;—makes him in some respects a greater mystery than ever before. Yet even here it has its side of hope, has it in its very name. And with man, society, the universe, all that he is identified with, still unfolding, instead of fearing that faith in him under evolution will die away, is there not good reason for believing that the conception of him will expand with their expanding; and that, while forever more and more the Unknowable, he will be forever more and more the Known?

The existence of such a First Cause is in-

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volved in the very nature of evolution. The two primal constituents, which its expounders have to assume the presence of everywhere it is going on, are energy and matter, or, if these are reduced to one, that one has to be energy. Matter alone cannot be conceived of as either moving itself at first or keeping itself in motion afterwards. All the forms of it anything is known about, from atom up to world, are pervaded with an immaterial something which makes and maintains them what they are. Nothing can be thought of as behind or before or within such energy to produce it, or as being in any way its cause. Matter may store it up as in dynamite or in a combustible body, but their manifestations of it are only the setting of it free. Even when a living being puts it forth, lifts his arm, or exercises a volition, he does not create it, is not a cause, as Mr. Martineau in his discussion of the subject seems to think, but is only an agent, using what has been gathered by him out of his food. Scientifically there are and can be no such things as "secondary causes," nothing but this one original, all-pervading First Cause. And not in some far-off beginning of things, reached only by an intricate process of logic, but wherever now we see anything being done, wherever any stage of evolution, there we are in

the direct presence of the universe's First Cause.

"They reckon ill who leave me out,
When me they fly, I am the wings,
I am the doubter and the doubt,
And I the hymn the Brahmin sings."

It is this that Herbert Spencer means by his phrase, "that Infinite and Eternal Energy out of which all things proceed," only the words ought to be "out of which and *in* and *through* which all things proceed." It is what those old heathen poets whom Paul quotes, expressed with wonderful accuracy,—Pagan gems which shine even in their Christian setting, when they said, "In him we live and move and have our being";—is what Paul himself rose to in his words, "For of him and through him and to him are all things"; and it is what poetry in all ages,—often supposed to be the antagonist of science, but really the rosy morning of its sunlit day,—has been the herald of, singing as it did in Faber,—

"God is never so far as even to be near:
He is within; our spirit is the home he holds dear:
To think of him as at our side is almost as untrue,
As to remove his throne beyond those skies of
starry blue;
We walk the earth ourselves his sanctuary."

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Such a First Cause, so far as evolution necessitates its recognition, may seem to be only unconscious force, only a Deity as unsatisfactory to the heart and to the spiritual nature as matter itself is. But force is only one of its forms, only that which shows itself in physical motion its lowest form. It is something which itself evolves,—that is recognized in the very definition of evolution, a process in which the retained motion undergoes, along with matter, a parallel transformation from homogeneity to heterogeneity. It shows itself step by step in intelligent motion, puts things together with a purpose, elaborates the crystal, rises up into life; that is what life is, evolved force, not merely the adjustment of inward to outward conditions, but the cause which adjusts them; and then rises up into consciousness, mind, heart, soul, duty, religion,—all flowing from it and retaining it as their substance, just as much as stars, earth, body, species and all the wonders of physical evolution do their primitive matter. And to get our conception of all that it really is as First Cause, it is to these higher manifestations rather than to its lower ones that surely in all scientific fairness we ought to look, just as to know the real nature of a tree we do not look at its roots alone, but at its fruit, and not at its green and imper-

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fect fruit but at that which is ripe and perfect.

There is one other difficulty which needs to be considered. Giving up the idea of any absolute beginning to things as necessitating the recognition of a First Cause, and accepting the present universe as only one of an infinite series whose First Cause is logical rather than chronological, it may be asked what then becomes of evolution otherwise than as operating within each term of the series? How is it possible as a progressive change from one of them to the other without its leading back to a primitive one, beyond which there can be no evolution, just as certainly as following back the changes of the present one alone was found to do? And, on the other hand, if there is no progress from one to the other, if it is only an infinite series of evolutions which in the end evolve nothing but each other, a First Cause which causes nothing in its last term more than was in its first, what is a belief in it but a giving up of any real, any eternal evolution, and how is it any more satisfactory to the mind than the old doctrine of an infinite series of changes which evolved nothing at all?

The difficulty arises from taking into the conception of the series only one kind of infinity, that of time, and not those of space

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and degree. To believe in an evolution that is without any absolute beginning, one that is able to be progress from universe to universe without either a first term or a last one, we must believe in a universe that is infinite in extent and infinite in its degrees of perfection, a universe, some part of which at least, has been forever in the past changing into something finer and better, and all parts of which, in the future, are to go on forever doing the same.

And who shall say this is not a possible conception? Who shall say this material universe is the only one which in the eternal years has ever been or will ever be? Who shall say that the endless variety from nebula up to Milky Way, and from amoeba up to man, which we know to exist in this universe which stretches through space, may not, also, be the law of that series of universes which stretches through time, giving evolution a field in which forever to evolve; and out of the very heart of the necessity which it puts us under of believing in religion's foundation, an infinite First Cause, unfolding also the necessity of our joining with it religion's crowning truth an infinite and immortal effect, making possible, also, an obedience forever of religion's injunction "Be ye perfect even as your Father in heaven is perfect."

Aiming along this new path opened in our day to learn whether nature would repeat the answer that, questioned in other ways, she gave of old, I have tried in its setting forth to avoid, as much as possible, all merely technical terms and all those subtle problems about the absolute and unknowable which belong to the realm of metaphysics, a realm in which I confess myself an utter ignoramus, and to use only common language and those principles which belong fairly to the realm of physics and of natural evolution. I know very well how narrow is the path and how liable the student is to mistakes when even in the realm of physics he comes to that border-land where the finite, either of space or time, reaches out into the infinite; know that what is law and truth and solid ground in the one may be disorder and falsehood and utter nothingness in the other; know that even in mathematics the exact truths with regard to finite lines and angles become the inexactness of those which are stretched out to infinity. But this is as true of the arguments against a First Cause as of those in its defense; and though it be regarded as only a speculation, it is a speculation which has the whole known universe as its basis; one that surpasses in grandeur all other thoughts, and that is reaffirmed by what comes direct through the

spirit's vision. Evolution and dissolution are but the systole and diastole of nature's great heart; life and death but the summer and winter of time's vaster year; all the myriad worlds the keenest telescope takes in, but one pole of the world's mightier globe; and all the long geologic ages and all the uncounted eons since the nebulous dust out of which our present universe came, but a part-way swing of that matter pendulum which ticks off eternity's seconds. And it is of such a universe, such a system of nature, that it gives us the cause, not the cause which merely as an outside hand wound it up in some far-off beginning, or repeated its windings on some special subsequent occasions, and then left it to run of itself, but one which is its mainspring and in all its movements then, now and evermore. To evolve is the necessity of his very being, as it is of the sun to shine and of the plant to grow. There never was and never will be a time in which he is to be thought of as an idle, or a sleeping, or a self-sufficient God; never was and never will be a time in which anything evolved will be separate from his pervading might. Not that he is the all himself; the doctrine is no pantheism; but, to use the exact Bible phrase, that he is the "all in all"; is the central sun that is forever shining and yet whose beams are never the same

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as himself. Worlds, universes, alike material and spiritual; there is no difference between them except of species and degree; they are the ether waves which go pulsing out evermore from his central warmth; evolution, that in the last analysis is the shining into finite forms of the Infinite Light. So believing, naturalism, more truly than any supernaturalism, can sing,—

“Thou art, O God, the life and light
Of all this wondrous world we see;
Its glow by day, its smile by night,
Are but reflections caught from Thee;
Where'er we turn thy glories shine
And all things fair are Thee and Thine.”

And knowing its diviner meaning religion can say of nature as earnestly as ever science has,—

“So welcome we from every source
The tokens of his primal force,—
Older than heaven itself, yet new
As the young heart it reaches to;
Beneath whose steady impulse rolls
The tidal wave of human souls,
Guide, comforter and Inward Word,
The eternal spirit of the Lord.”

XII

WHAT BECOMES OF THE FATHERHOOD OF GOD UNDER EVOLUTION?

Of all the various names which have been applied to the Deity, setting forth one and another of his attributes, the most distinctive and precious is that of Father, our heavenly Father. It is the high water mark of the old type of religion, the religion of sentiment and emotion as distinguished from the religion of science and law, is the measure of the immense progress which had been made from the time when even among the most advanced races on earth his highest symbol was a stick or a stone; and around it have been gathered age after age, all the great hopes, beliefs, affections and venerations of our larger Christian faith.

But how far can this conception of him be retained under the new scientific light of our time,—how far, especially, can it be made consistent with the great evolutionary doctrines of man's descent from the brute creation and of the Deity as "that Infinite and Eternal

Energy" out of which by natural force and law, all things, alike the evil and the good, are thought inevitably to proceed? A lady of my acquaintance was present at an Orthodox church awhile ago where the minister was preaching on the absurdities of this new science with regard to the origin of man. "An evolutionist," said he, "looks up into the face of a baboon or a monkey and proclaims 'Thou art my father;' but we Christians look up into the face of the all-loving and all-perfect God, and say 'Our Father which art in heaven!'"

Deeper down, however, than this merely superficial difficulty, is that awful shadow of ferocity, cruelty, blight and wrong which over-lies so large a part of the divine realm here on earth,—the organic world's fierce struggle for existence, its overpowering of the weak and sick by the well and strong, and its necessity of their eating each other up as the only way of their getting food; the awful convulsions and severities of the inorganic world, the earthquake, the tornado, the drouth, the flood, the frost, destroying myriads of living things without even their use as food; and the vice and crime and tyranny and inequality and poverty and suffering which prevail worst of all among his human beings. Under the old doctrines of the Deity as a Being outside of nature, and of

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Adam's Fall as having dragged the world down, it was possible to explain such things as the result of man's disobedience, and as occurring without the immediate action of divine will, thus relieving him to some extent, at least, of their responsibility. But under the modern scientific conception of God as immanent in nature and as the energy out of which all things immediately proceed, there is no possibility of such an exculpatory explanation. Science cannot have him in the sunshine and leave him out of the storm, near in the flower and far in the frost. The animal world's struggle for existence and eating each other up as food are shown by it to have been instituted eons before there was any man to sin. And with God the energy out of which all things proceed, it must be his own arm directly which starts the earthquakes, and his own breath immediately which blows the whirlwind. "That," said an eminent scientist to me once with whom I was talking on the subject, taking down a hawk's claws from his cabinet,—"that is what I find in the God of nature, and when I want this"—opening his Bible and pointing to the words, "Like as a father pitieth his children, so the Lord pitith them that fear him,"—"when I want this kind of clause, I have to go for it to the pages of Scripture." It is

a difficulty which is not a mere theoretical one of the scholar's study, but one which forces itself on everybody's attention, one which clutches at our nerves and heart-strings as well as at our minds and philosophies. There are multitudes who accept gladly the scientific doctrine of the Deity as the great indwelling spirit of the universe, and who can see that it adds infinitely to his grandeur as an object of reverence, but also feel that in doing so they, to be consistent, must give up the genial home warmth and sweet paternal relation which have been so long associated with his endeared gospel name; and perhaps there is no truth which the words of this earth can express that to thinking, feeling men and women would be so comprehensive, so precious, so welcome, as the one which would enable them, in the midst of the natural world and in the full blaze of evolution, to look up and say with the old faith and the old love, "Our Father which art in heaven."

I am free to say that I do not think it possible to make the two conceptions of him parallel in all respects, any more than it is the two of anything, one of which comes through the mind and the other through the heart; do not think it is desirable to do so, for in that case neither of them would add anything to what the other gave. But I do think the sci-

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tific view of him includes in its drier light some, at least, of the paternal attributes which are so precious in the religious view. And it is on this most important question, how far the God of nature and of evolution can be spoken of as Our Father, that I shall dwell in this lecture.

Look first at the matter subjectively. How did religion get the name and conception of the Deity as Father, our heavenly Father? It is commonly thought that it was supernaturally revealed through the lips of Jesus, and that it was the distinctive gift of Christianity to the world. But as a matter of fact it is older than Christianity, older than any of the world's existing faiths. It originated among our old Aryan ancestors thousands of years before the Christian era, in what to them was pre-eminently a natural religion. Among their many deities was one they called *Dyaus Pitar*, literally the Sky Father; and when the original Aryan religion died out, the name was a part of the precious goods it distributed among the nations that were its descendants, becoming with the Greeks *Zeus Pater*, with the Romans *Jupiter*, meaning the same thing, with the Scandinavians *Alfadir*,—All-Father—and with the early Christians, “Our Father which art in heaven.” The name, therefore, is strictly a natural evolution, not something which Chris-

tianity gave to nature, but which nature gave to Christianity ; and though under Christian nurture its contents of tenderness, care and spirituality have been immeasurably enlarged, it is only fair to argue that to the primitive Aryan mind it must have expressed, as the root out of which its after growth came, a real aspect of nature, otherwise it is a name which would never have been suggested.

The Dyaus Pitar, to be sure, has not been the world's only nature god. The Aryans themselves had other deities with other names expressing other and sometimes the darker and more terrible aspects of earth, air and sky, as Rudra the god of storms, Agni, the god of fire.

Polytheistic also have been all the religions which came from Aryan stock, many of them with divinities whose attributes were the very opposite of what is fatherly, as Ahriman, Siva, Mars and Thor ; and even in our Christian faith the conception of a Father God has not always been so all-embracing but that it has had to be supplemented with such names as Jehovah, Lord, King, Almighty, Triune and the like, taking in what were thought to be other of his attributes, and with such a being as Satan to include his relation to the kingdom of evil. But this only strengthens the argument for the reality in nature of what under-

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lies the word Father, for it shows the name has been put to what in evolution is the supreme test of a thing, the struggle for existence. And it has survived, has killed out or absorbed all the others because it has proved itself to be the fittest, has expressed better than any of the others what under the world's increasing intelligence has been found to be not only the needs of the human heart, but man's larger mental conception of what exists really at nature's heart. Even amid the crudest beliefs with regard to immediate evil divinities, faith in a supreme one who has the paternal characteristics has often curiously cropped out. The story is told of a farmer in England somewhat unfortunate in his crops and in his family affairs, whose minister sought to comfort him by saying they were not accidents but the dispensations of an All-Wise Providence, to which he ought cheerfully to submit. "Oh, yes," was the answer, "I well know it was Providence that spoiled my crops and killed my children; it is Providence does this, and Providence does that,—nothing but Providence picking on me all the time; I hate Providence; but I am thankful there is One above who will at last set things right." And in all the Ayran mythologies along with their recognition of agencies in nature that for the time being were setting

things wrong, there has always been, dim or clear, this trust in one above them who in the end would set things right,—above Ahriman Ormazd, above the tricksy pantheons of Olympus and Asgard a paternal Being whom alike gods and men were bound to obey, and above Sinai and Satan a heavenly Father who at last would put all enemies under his feet and be the world's all in all.

But we are reminded that man's conception of what Deity is did not begin its evolution with the old Aryan faith, or with divinities anywhere which had even the faintest lineaments of a loving, paternal face. Spencer, Frazer, Tylor, Robertson Smith and others have traced back religion through the worship of idols, animals, the heavenly bodies, sticks and stones, to that of the ghosts of dead ancestors; and now Mr. Grant Allen comes along and after reviewing and re-proving all these steps, goes back beyond them, back even of the ancestral ghost, and shows that the first step was the worship of the mere dead body itself, apart from even the crudest idea of spirit,—argues that even the Christian conception of a heavenly Father and the Hebrew one of Jehovah originated in the homage paid to a dead savage chieftain.

It is a view on the face of it which is the most

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startlingly atheistic of anything scepticism has yet set forth. The conception of Deity is naturally thought of as meaning the same thing as Deity himself, and the evolution of the conception from the sight of a dead body or from the shadow of a live one is thought of as covering the evolution from such a source of everything which is divine; is tracing the broad highway of Christianity in which God moves as a Father, out beyond civilization and beyond heathendom into a wilderness where it not only narrows to a squirrel path and runs up a tree, but to where it comes down even from the tree and disappears as a hole in the ground. "Who is your God?" asked a traveler in Arabia of a Mesaleckh nomad. "It was Fadee," answered the man, naming a powerful provincial chieftain recently deceased, "but since his death I do not really know who, at the present moment, my God is." That is the first impression made by these recent investigations, that having traced him to the dead body of a savage chieftain buried in the ground, evolution does not really know who at the present moment its God is. Most of the criticisms on "the ghost theory," as it is called, have been based on such a confusing together of the reality and the idea. Even our friend, Rev. Mr. St. John, in his notice of Grant Allen's book contributed to *The New*

World ridicules his work as "a sketch of the evolution of God" and its author, because of it, as having "clearly abdicated his throne of intellectual leadership."

Mr. Allen is, perhaps, careless in some of his expressions. But the very title of his book, "The Evolution of the Idea of God," and his explicit statements that his purpose is not "any kind of inquiry into the objective validity of any one among the religious beliefs," that "the question whether there may be a God or gods does not here concern us," and that he does not attempt to "cast doubt upon the truth of the evolved concepts," ought surely to have prevented any such mistake. It would be just as fair to say of a writer who, in giving a history of astronomy, had traced it back through its Tycho Braeic and Ptolemaic theories to the conception of the sky as a fixed hollow sphere a few miles above us, that he is ignoring the real heavens; or of one who in describing the development of electrical science should begin with the attention drawn to it by the dancing of pith balls and the twitching of a frog's leg, that he made these the source of electricity itself, as to charge that a scientist who finds the starting point of a man's idea of God in a dead ancestor, is thereby ignoring the infinite reality and making the heavenly Father him-

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self grow up from the lifeless body of an earthly parent.

The fact is, Mr. Allen's book, though open in some places as he himself says to further question, is a reverent and exceedingly interesting summing up of the discoveries made in recent years of how religion reached its present advanced stage. It is as full of curious facts about theological ideas as Darwin's "Origin of Species" is about animals and plants. Many things in our present ecclesiastical customs otherwise unaccountable and hurtful, are explained by it as beautifully and satisfactorily as the fossils of the earth's strata and the rudimentary organs of the human body are by geological and organic evolution; and rightly viewed the process it describes is no more degrading to religion than the tracing of man up from his monster animal ancestors is to our present human nature.

Then apart from any special theory, the evolution of a natural religion from such unpromising beginnings is the very thing we ought to expect, so in harmony is it with the evolution of all other natural things; and instead of doing away with the need of recognizing a divine reality behind it, is what implies in the strongest possible way his actual existence. For according to the fundamental prin-

ciples of evolution there must have been some cause for this long and wonderful growth of its inner God-idea, some quickening at first by a suitable environment of its humble germ, and some corresponding nutriment afterwards for its development, just as in the evolution of astronomy there has been the actual sky, and of electrical science electricity itself. What in religion could this cause, this environment, this nutriment have been? What but a divine spiritual reality? The relation of Mr. Spencer's dreams and shadows and Mr. Allen's dead bodies and sticks and stones to the actual all-embracing Deity has possibly been something like that of foreign bodies, sometimes mere specks of dirt or wisps of straw, to the solution out of which crystals are formed. The foreign substances do not of themselves make the crystals and are no real part of them when made,—rather often mar their appearance. They simply afford the requisite starting points and stimulants for the formation of them out of and by the solution itself,—to the chemist's eye would imply its existence by the use made of them, even though it could not otherwise be seen. And though the crystals at first may be imperfectly shaped, owing to the crowding of them together and the smallness of the vessel in which the solution is held, yet, as the vessel

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is enlarged and scope afforded for their full development, they take more and more their own special shape independent alike of vessel and of nuclei and at last show forth, next to animals and plants, the most beautiful and wonderful objects of nature. So with the crude material bodies in the worship of which religion begins. They are no part of the thing itself, no indication of what its real divinity is. They are only the specks and straws for the mind's surrounding spiritual medium to start from in forming its conceptions of the Divine. It is the surrounding spirit which makes the conceptions,—narrow and crude at first and partaking, as might be expected of the impurities and limitations of the minds in which they are formed and of the objects from which they began, but gradually getting away from these, and crystallizing at last, in accordance with the tendency of spirit's own intrinsic nature, into that idea of God as a heavenly Father which is so precious a part of our Christian faith, the whole just as truly a culmination in the process of natural evolution as anything there is in the outward world, and not by any means less wonderful or less reliable because of its unpromising start and of the strange forms it has taken along its way.

Turning now from this subjective conception

of God as a Father reached by evolution, to what evolution has to say about his being such to human beings objectively and in his actual relations to them as the presiding spirit of the universe, the first point for comparison is that of progenitorship, being the source from which they have naturally come. The relation of an earthly father to his children begins in his being their originator; and this means not that he has created them artificially, or that he has spoken them into existence supernaturally, or that he has adopted them by a legal process from some other family; but that he and the mother have brought them forth naturally from their own bodies and endowed them, in the very act of doing so, with a part of their own life. What is this, however, but the very thing evolution teaches was the origin of man? He is not an artificial product, not something which was created all at once by a fiat of the divine will, not a creature who was brought here from another world, but a being who by a strictly normal process was evolved out of nature, that nature, including alike matter and its infinite and eternal energy, which to science is only another name for God. What though man went through a myriad animal forms on the way? That is what we know now every child does embryonically in coming from his human

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parents, starts on the lowest animal plane as a mere cell, and unfolds partly before birth and partly afterwards, step by step through every stage that Darwin has shown that our race has passed through in passing from moneron up to man, some of them so like those of the lower animals that it is only an expert anatomist can tell the one from the other. Yet who thinks that on that account human beings are any the less his parents? It is what we start from, not what we go through along the way, which determines origin. The most bigoted anti-evolutionist knows beyond dispute that his human ancestors a few generations back were savages. Yet what would he think of a minister who should get up in the pulpit and say, "The anti-evolutionist looks up into the face of a savage or a barbarian and says, 'Thou art my progenitor,' but we Christians look up to the Infinite and Eternal God and exclaim 'O thou, our Father which art in heaven.'" Yet how could this be a particle more absurd than the implied argument of the minister that because the evolutionist recognizes anthropoids a little further back as in his line of ancestors, he is therefore cut off from believing that he has a heavenly parent? The fact is, trace back man as far as we will through the ages of the past, his paleontological footmarks all start from

Deity. The life with which he began, though undoubtedly an evolution, like everything else in the universe, from a preceding natural state, must have been not the less an outcome of that divine life which was never outside even of inorganic matter; and when what hitherto had showed itself only as force, shaped on earth its first protoplasmic cell,—that out of which all others have come, that which, according to Weissmann, still survives immortal amid all the deaths of its myriad descendants, in that cell, rather than ages after, when it was born a fully developed human babe, was revealed, so far as origin is concerned, the Fatherhood of God.

Again human fatherhood implies some resemblance between the child and the parent, some qualities which are common to them both,—a likeness between them which is accepted everywhere as at least one evidence of their relationship; and though at first the resemblance may be very incomplete, though there is a wide difference between the statesman managing the affairs of a mighty nation, and his little child at home “pleased with a rattle, tickled with a straw,” yet beneath this difference, as we know, they have the same human nature, are made of the same substances, body and soul, and have the same spiritual capacities

for appreciating the beautiful, the true and the good.

Evolution disclaims utterly the idea that God is like man in bodily form,—in limbs and features, shape and structure. But when inner qualities are considered, those which are intellectual, moral, emotional and spiritual, is the difference otherwise than in degree? How do we get our knowledge, so far as science is concerned, of what God is? Plainly it is by the study of the universe around us,—this that is his manifestation and embodiment, this that has proceeded out of his infinite and eternal energy. But what is the universe thus open for our study? Not its matter and force, suns and stars, cliffs and clods alone; but with them its spiritual parts, its men and women, minds and hearts, virtues and intelligences. And taking these into the account, regarding them all as his manifestations, imperfect, to be sure, yet having some basis in reality, then evidently there must be a likeness between the Being who is thus manifested and the human beings who are at least a part of the objects through whom and to whom the manifestation comes. Indeed, *what* is the science itself that reads the universe but an evidence of such likeness? The only way in which we can understandingly read anything, any book, any picture, any ex-

pression on a fellow creature's face, is by virtue of something which is common to ourselves and to the one who wrote the book, made the picture, wore the expression. So with the universe. Science finds it put together with wonderful intelligence and wisdom, full of beautiful pictures, and richly stamped with expressions, in its human objects, of love, benevolence, sympathy and moral order. What do these mean but that there must be something in the power that placed these qualities there which is akin to what is in the beings who find them there, something in the Father who writes meanings in the world's great letter which resembles what is in the child who is able to read the meanings of the world's great letter? And if along with the diviner things we find in the universe, there are mingled some which are brutish, some which seem to have no resemblance to our highest conception even of human fatherhood, may it not be, as explained by evolution, because the universe as yet, with all its age and all its grandeur is only at its embryo stage, only on its way through its brutish forms to that maturity in which, like the grown man, it shall be in all respects the image of its great original?

But above progenitorship and resemblance, human fatherhood means love for its offspring,

a love which shows itself in kindly intercourse with them as social beings, in provision for their wants, and in their protection from dangers and foes, a love which does not depend for its exercise on their greatness or worth or service, but on their being his children, and which finds its reward in the happiness, not of itself, but of them. Does the father build a house, it is not more for himself and his wife than for his children. Does he go forth to toil hard all day in the shop, the counting-room and the field? It is that he may earn bread not for his own mouth merely, but for his little ones at home. Is a fortune won? Ah, he says, now I shall have something to leave my boy and girl. Does danger threaten, sickness assail, do foes attack? It is their cause he makes his own, and help to them in some way that he seeks to give. And does he want companionship and social delights? There is no wisdom of philosophers, or beauty of poets or graciousness of kings that he finds so sweet as the cooing of his little baby tossed in his arms, who cannot speak a word. What is there in the God of evolution and science which corresponds with these qualities of paternity?

Well, no audible speech, no coming home at night and taking his creatures bodily on his knees, no rushing out visibly to rescue them

from the earthquake and tornado, robber and tyrant. But there are other ways in which a love not unlike that of an earthly parent for his children is really shown. What is this whole earth but a mighty house he has built in which for them to dwell? What are the coal, and oil and metals and sunshine and air stored up in it from cellar to ceiling, but his provision for their wants? What are its myriad laws and forces, winds and tides, heats and colds, electricities and magnetisms but the hands with which he is toiling day and night to promote their welfare? What poetry and art and science and civilization and religion but the fortunes ever larger and larger which he is bestowing on each new set of his boys and girls?

To be sure, he makes them work with him to obtain many of these blessings, and allows them to fall into dangers, hardships and trials, and to be overwhelmed with storms, earthquakes, diseases, injustices and tyrannies without any visible interferences to give them help. But in the larger view such things are only the rougher outside of what within are equally blessings, are needed even more than the easy, pleasant things, are to train up their recipients in the highest degree as his children. Suppose that he omitted them from his gifts,—did as some people would have him do, allow his

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creatures to experience only the smooth, soft, beautiful things of life, what would be the result? You occasionally see some parents, mothers especially, who have tried on their children that very thing,—have done for them with their own hands all the work of life, crammed them with food, provided for them every kind of amusement, tolerated without punishment their wrong doings, and sheltered them from all hardship and harm. And what has been its influence on their characters and their real happiness? Why, there is no malignity of devils which could have done them such injury, no incarnations of hate which could have been more successful in making them sometimes milk-sops, sometimes knaves and villains, and always the embodiments of downright selfishness and conceit.

Fortunately the God of nature is no such parent, is not a mother, as some would call him, but a father, one who has the wise and far-reaching love that when they are needed supplies his creatures with hardships, puts them to public school out in the universe, provides them with the raw materials of happiness, but lets them have the added pleasure of manufacturing the materials into actual things, allows them now and then a round of fisticuffs with the earthquake, tornado, pestilence and

famine, and teaches them the value of liberty, virtue and right by having them of themselves knock down tyranny, vice and wrong. It is by man's wrestling with things which are often regarded as the evidences of a lack in the world of any paternal care, that he gets not only new strength for himself, but at their core one of a Father's strongest protecting arms, and out of the nettle danger, plucks not only the flower of safety but a flower which has in it the very breath also of Infinite Love.

"By adversity are wrought
The greatest works of admiration,
And all the fair examples of renown
Out of distress and misery are grown.
The gods in bounty work up storms about us
That give mankind occasion to exert
Their hidden strength, and bring in practice
Virtues which shun the day and lie concealed
In the smooth seasons and the calm of life."

Yet while recognizing the element of fatherhood even in the most terrible things of nature to be obtained there by those who overcome them, it would be wrong to suppose his paternity is only in what is terrible and is only to be obtained by his strong and victorious children. One of the most touching incidents in Homer's Iliad is where Hector, the Trojan leader, just

before going out to battle with the Greeks, comes home to take leave of his child, the young Astyanax, and, finding the little one frightened at his nodding plume, takes off his helmet and lays it aside to let him see only the father's loving face. Nature is full of scenes where the eternal captain does the same,—leads his adult sons to battle with the warrior's nodding plume, but when he comes to embrace his little children, takes off his more terrible accouterments, and appears to them as the warm sunshine and the pleasant breeze,—reveals to their weakness in all its beauty that Father's smiling face which to others he hides behind a frowning Providence.

There is one thing more implied in all true fatherhood, which it will not do to leave out of sight, love and care for its offspring, alike the older and the younger, not only in the mass, but also as individuals, not only as so much childhood, but as so many children. When a king loves his subjects, or a general his army, or a philanthropist his race, it necessarily has to be as a complex whole, with only the merest fraction of them known to him by name, and with thousands and millions he has never personally met, or taken any individual interest in. But the peculiarity of a father's relation to his children is that he knows them one by one, has

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a name for each, and makes each the object of a distinct and individual affection.

At first it looks as if nature was the very opposite of this, concerned herself with things as a whole, but not with their individual parts,—

“So careful of the type she seems
So careless of the single life.”

But as under the guidance of science we examine her tendencies more minutely and higher up, we find that it is preëminently the individual she has in view and it is towards him that all her progress is being made. The universe, to start with, is a homogeneous mass, and the first step of all evolution, and one it keeps repeating wherever there is homogeneity afterwards, is its differentiation into a multitude of distinct parts,—into elements, worlds, species, races, nations, classes and finally individual men and women, and the giving to each of them its own distinct life, form and functions, and its own special food, protection and care. Nature's providence is all “special,” and special beyond anything human fatherhood is ever capable of. Gravity never forgets an atom of dust any more than a Jupiter or a sun. The same skill is used in painting the spots on a butterfly's wings as in filling the sky with stars.

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and the evening twilight with crimson and gold. The humming-bird and the dove have been provided with the means of coming down the ages through the world's great struggle for existence as safely as the elephant and the lion. Limbs and senses and brain and soul are given as carefully to the child which is born in a hovel as to the one which is born on a throne. When evolution passes on to its last stage, that of integration into human society, it is only to make its wholeness the means of yet further perfecting its parts. And though in time individuals die while the race lives on, yet as the final outcome, everything in evolution points to the race as what, with a perishable globe, is to perish, and to the individual souls that age after age are springing from it and apparently dying, as the products which, if anything, are in other worlds to live forever, the supreme objects, therefore, of the world's paternal care.

It is on these grounds and in these respects, the respects of origin, likeness, love and individual care, that I think we may safely regard the God of nature and of evolution as a Father. The word may not express all that he is known to be in the light of science, or all of the unknowable that he is made to be in the darkness of metaphysics,—every father, even

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here on earth, having a vast number of other relations and attributes besides the parental ones, which go to make up what he is as merchant, mechanic, citizen, friend, neighbor; but it does set forth one part of what he is, one that, whatever else about him remains to us unknown and unknowable, we want preëminently to be certain about. As a party of botanists were exploring the hills of Scotland in the interests of their science, they discovered one morning a rare flower halfway down a steep precipice, which they were very anxious to secure. But the single rope they had with them not being strong enough to bear the weight of a full-grown man, it was proposed to tie it around a little boy among them, the son of one of their number, and let him down to where it was. The boy looked over the brow of the cliff at the fair flower nodding in the morning breeze, and at the awful abyss and jagged rocks far below it, and for a moment hesitated; then turning to the smiling parental face that bent over him, he bravely answered, "Yes, I will go, if my father will hold the rope." Why? Not because there were not arms there as strong as the father's arm; not because there were not eyes there as keen as the father's eye, not because there were not heads there as cool and well-balanced as the father's head,

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but because the boy felt instinctively that there was something in the father's heart, a love tie, a love sight, a love skill mightier than muscle or eye or brain, which would never, never let him fall. So with the boy, man swung off by the God of nature with evolution as the rope over the abysses of earth and space and time to pluck the flowers of knowledge, love, grace and virtue, he can do it without fear because back of all law and force, it is a Father's hand which holds the rope.

XIII

A SPIRIT WORLD AS THE NECESSARY OUTCOME OF THIS WORLD'S EVOLUTION

Having traced the bearings of evolution on some of the great problems of religion that are connected more especially with this present world and this present life, we come naturally to its relation with those which open out beyond earth and time into a spirit world and a future life, or, to express it scholastically, to the eschatology of evolution.

It is a subject whose significance is in some respects less and in some greater in our day than it ever was before. Less, because man and society have now reached a stage in their evolution at which life here to many persons is so rich, rounded and complete that they have little temptation to look beyond it for another which shall fill out its deficiencies. Greater, because the very wealth and wonder of what has been evolved and is yet further to be evolved, make its final loss seem all the more

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terrible, and our interest in its final outcome all the more absorbing. Immortality and the spirit world, connected with the idea of an endless evolution alike to the universe and to ourselves, mean more, infinitely more, than was possible when their utmost reach was an existence and a heaven—

“Beyond the blooming and the fading,
Beyond the shining and the shading,
Beyond the hoping and the dreading,”

mean so much more, that their very greatness is what most stirs our doubt as to their possibility. Then there are those affections, those yearnings to meet and know and love again those we have met and known and loved on earth, which are surely not less ardent, not less characterized with eternity-hunger now than in the past. And so, taking all together, I believe that man is asking to-day, if not with more faith and hope, yet with more eagerness and desire than ever before, the old, old question, If a man die shall he live again?

Four different sources have been recognized in the past as the ones from which possibly to get its answer,—one, a supernatural revelation of it by Deity, witnessed to by miracles and especially by the supreme miracle of Christ’s resurrection from the dead; another

the revelation of it by spirits once on earth, who have returned from beyond its bourne to tell their friends, yet here, of the world and life which are there; a third, the soul's direct perception of it through its own faculties, as witnessed by the belief in it among all people; and a fourth, the intimations and proofs of it found in the arrangements and outlooks of this present world.

But as regards the first of these answers while there are multitudes of people who rest in it joyfully as the all-sufficient ground of their faith, there are other multitudes who under the stress of modern criticism have had their trust in its reliability greatly weakened. As regards the second source, while to those who have in themselves the spiritualistic faculty, its testimony is very precious and convincing, its value to the world at large has been utterly destroyed by the unspirituality of its communications and the immensities of fraud with which it has been connected; and as regards the other two sources, those of nature and of human nature, their answers hitherto have been so vague and logically far-fetched that only a determined believer beforehand could ever be convinced of their truth. So it is not strange that with the advent on a stage of this new source of knowledge, evolution, one that

reaches back as nothing else has ever done into the immeasurable past and has given us so clearly the story of man's origin, there should have been an eagerness to find out whether it can reach forward with equal certainty into the immeasurable future, and solve in a like manner the problem of man's destiny.

Its first answer, it must be confessed, is anything but encouraging. Directing its inquiries to the origin in the human mind of that belief in a spirit world and a spirit life which is now so prevalent among all people, instead of finding it came from a direct perception of its reality, it has been traced back by Spencer, Frazer, Tylor, Lubbock and others to the crudest and most superstitious material sources,—dreams, shadows flitting over the ground, breaths of air which could not be seen, strange noises, and motions of objects without any apparent mover, trivial things that we now know well enough must have had a physical origin; and it has been shown by innumerable examples, how these early materialistic impressions have been developed step by step under the aid of mythology, and of the poetic imagination, "giving to airy nothings a local habitation and a name," into our present refined conceptions of a heavenly world. It is a most depressing study. Very naturally the

reader of its results is led to feel that what started so evidently as a materialistic misconception at one end of the line, cannot have grown into a reliable spiritual reality at its other end, and that a world whose foundations rest on a dream must be in its loftiest superstructure no better than a dream also. We have exactly the same starting point of superstition rising to-day in the mind even of civilized man. Let anyone be alone at midnight in a strange house, or walk alone through a graveyard at that dark and fearful hour "when injured ghosts complain" and notice how startling, in spite of all his sceptical philosophy, is every unusual sight and sound. Read Mrs. Crowe's "Night Side of Nature" in the night and prevent the hair, if you have got any, from rising on the outside of your head, whatever the flatness of your incredulity may be on its inside.

Butler's *Hudebras* did not go astray in his satire when he sang

"Night is the Sabbath of mankind."

And Coleridge's Ancient Mariner had only a common experience in being

"Like one that on a lonesome road
Doth walk in fear and dread,

And having once turned round, walks on
And turns no more his head,
Because he knows a frightful fiend
Doth close behind him tread."

With the appearance of the sunlight and the society of our fellowmen, such sights and sounds all sink back into their true place as mere physical phenomena,—are what no enlightened religion ever thinks of referring to now as any foundation of its belief in a spirit world. And why, it is asked, should the faith which has been evolved out of precisely similar ones existing among savages thousands of years ago, be regarded by us as of any higher authority?

To give a single illustration,—the night before my father died he told me the story of a man he knew of when a boy, a rough, dare-devil sort of fellow, despising all belief in God and spirits, who had occasion very late one dark night to pass by the old graveyard in Ipswich, at that time a very lonesome and neglected spot. When directly opposite to it, he heard a low, pathetic moan come from over in its enclosure. Most people about that time would have hastened their pace if not into a run yet into a double-quick march. But he said to himself, "Well, now is a good chance for me to find out all by myself whether there are really any such things as ghosts or not,"

so he clambered over the wall, and followed the sound, breaking forth at intervals, till he came to the door of a tomb. Most of us would probably have ended our investigations as to the reality of a spirit world right there, and have hurried back to our own flesh and blood world. But this sceptical old man resolved to see the thing through, so tried to open the tomb door and get in. But it was locked and rusty, evidently had not been opened for years. Nevertheless, with his rattling, more distinct than ever came forth the pathetic moan, not exactly human, but enough so to suggest that it might come out of what was once a human throat now somewhat dry with death's dust. With that he climbed up on top of the tomb, and there found that a part of it had caved in, leaving a hole large enough for his body to get through, and out of which, beyond all question, came the moan, reminding him of the hymn, "Hark from the tombs a doleful sound." Afraid if he jumped in directly, he would never be able to climb out, he hunted around in the dark till he found a stick large enough to lay across the hole, then tied his handkerchief to it and let himself down into a place a little darker and more forbidding than even Grant Allen has ever pursued his investigations in, and feeling carefully

around among the coffins towards the corner from which at intervals the moan still came, what do you suppose he found? A little lamb that while feeding above, had fallen down through the opening and broken its leg. I am glad to say he did not leave the poor creature there, but clasping his legs about it pulled himself out and went whistling home more a sceptic than ever, and showing his Christian friends the next morning the specimen ghost he had resurrected from a tomb.

How many are the ghost stories and the uncanny things the world in all ages has been full of, that, traced to their source, would be found to have a similar lamb-like origin? And how natural it is to infer that the belief which has been evolved from them is equally baseless: but this is only a superficial inference. Paradoxical as it is, the physical origin of such sights and sounds is a vastly better evidence of a real spiritual world behind them than their unexplained source would be. For, unless there had been in man beforehand some dim consciousness of such a world, no mere physical object, however strange, would ever have suggested to him the idea of spirit. Such objects are like the strange woods washed up on European shores in their relation to the discovery of this new geographical world. They did not

make of themselves the belief in its existence. That belief as a possibility was already in the mind of a Columbus, introduced there by finer faculties than those of sight; and it was that belief which gave the waifs to him their wonderful new world significance. So with that other world across wider seas whose indications on these shores of time were, to begin with, so fearfully crude; it was faith already in man's soul which clothed them with a spirit meaning. Like everything in evolution, it had to begin with something that was crude and unlike its full self,—a nebulous mist, a molten globe, a protoplasmic cell. That non-physical world we all have within us did the same, all its terms having a physical origin, and all bearing still some traces of their lowly birth,—as the understanding, that which stands under; right, a straight line, wrong, a crooked one; morality, outward custom, and the like. And yet who now on that account believes that what they stand for intellectually and morally is any the less distinct reality?

And what is true with regard to those ancient things in which faith in a spirit world began, is true with regard to what are called our superstitions now. They are not really superstitions, that is, things standing over our faith, but substances, things standing

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under it, as the writer of Hebrews uses the word, that is, the foundation of the higher things hoped for. Instead of being despised, they are to be honored,—are worth more than all the books of theology ever written as proofs of a spirit world. The subconscious man is always the true, natural man, is always religious even when the one above him, the conscious man, is an atheist, is often more truly religious than when the one above him is professedly a Christian. We all of us have in this under personality, not only a marvel of psychology, but treasures of knowledge-material with regard to the past, more wonderful than the fossils geology digs out of the rocks, more ancient than any written history, more precious religiously than any apostolic manuscripts found by pious seekers, buried in Syrian cells. The beauty of them is they are born anew with every child, are what time never can crumble into dust. Some day evolution will learn to read them as one of its richest chapters. And among them it will find, not least precious, the indications from the very start, crude though it be, of a genuine spiritual faculty in our human nature:

"Like plants in mines which never saw the sun
But dream of him and guess where he may be,
And do their best to climb and get to him."

But this faculty, how did it originate, how is its existence a proof in any way of an actual objective spirit world? These are questions evolution must answer before we can be sure of a realm beyond matter in which a future life is possible. They are ones it does answer, and its answer is, precisely in the same way that man got his other faculties and is sure of an objective material world. How did the primitive animal from which man is descended get its bodily eye? By the action on its general nervous sensibility of that world of light it was surrounded with. How its ear? By the action and in the same way of the atmospheric world of sound. How his intellectual powers? By the action of that truth, which is in all things, on the bit of brain the action of his outer senses had gradually stored up. It is all obscure as yet, but about the tendency of the environment to produce changes in the environed that will bring them into relations with each other, there can be no question. We see it in the different colors the different seasons make in the fur of animals at the North; in the modifications which have taken place in the whale, once beyond question a land animal, to fit it for the water; in the dependence of a child on the talk of other children to develop its own powers of speech, and in the need with

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us all of a civilized atmosphere in which to grow up as civilized human beings. On the other hand, how can there be any stronger proof than the eye itself that there is around it a world of light; than the ear that there is in contact with it an atmospheric world of sound, and our intellectual faculties that the world in which we live is an intelligible and truth-related world?

Why now does not the same proof hold good with regard to the origin in man of spiritual vision and the existence around him of a spirit world? When all his other faculties had been started, his spiritual environment acted on his inner sensitiveness in the same way that his light environment had on his original nerve sensitiveness, and the result was at last an inner vision for its own diviner radiance. Of course it was at first very imperfect in its development and efficiency. Like the bodily eye it would not recognize itself as a distinct entity, but only the physical objects that it seemed to be reflected from. But a beginning had been made, the origin of a new species in the kingdom of mind, so that thenceforth it was only a process of ordinary evolution for it to distinguish spirit itself from the strange physical things which aroused it into action, and if we can trust evolution's law of the environment

anywhere, then surely man as a spiritual being must have, not far away, but right around him, a spirit world.

The discussion thus far may seem to be a look backward instead of forward, an inquiry into the beginning of things rather than into their eschatology. But before showing the possibility of a life beyond this present world, the first step must evidently be to show the possibility of a world beyond this one into which for the life which is here to evolve; and with such a one shown, and shown also to have begun its work on man already in time, it will be seen that the presumption of his being destined to enter it altogether at last, is not a little increased.

Passing now from human nature to inquire of physical nature through the same interpreter what its teaching is as to its having anything at last to send on into the spirit world, its answer at first is even more discouraging than was the opening result of its inquiries within. If the universe is full of evolution,—forces which build up, it is full also of dissolution, forces which tear down.

“Evolution ever climbing after some ideal good,
And Reversion ever dragging Evolution in the
mud.”

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The flower unfolds into beauty but to fade into dust; the forest into verdure, but to drop into death; the animal into strength but to age into weakness. Mountains, rocks, continents are only the flowers of a little longer day; species, races, nations, only the animals of a little larger growth. While minds grow god-like with maturing years and have their thoughts widened with the process of the suns, yet as the years ripen more and the suns proceed farther, even minds sink earthward and have their thoughts narrowed again. Write at twenty-five the inspiring words,—

“Not in vain the distance beacons, forward let us range,”

and at eighty-five the despairing wail,—

“Gone the cry of forward, forward, lost within a gath’ring gloom.”

And with birth, growth and decay the history of all the separate parts of the universe, how direct appears the inference that it will finally be the same with the universe as a whole, its life wither as the rose, its humanity perish with the animals from which it sprang, its ripened star fruit

"World by world drop mellowed off
The winking stalk of time,"

and its mighty trunk, dead at the core and dead in its every nebulous branch, tumble back like the tree into the chaos from which it came.

Direct, however, as such an inference seems, it is really only nature's outside answer, only a method of condemning superficiality in her students such as she uses everywhere. Going deeper down into her teachings, going, especially, with evolutionary principles as our guide, it will be found that nature's old pathway of death, hitherto so full of darkness, is itself partly luminous with life's light, that out of its very decay there shines a mild phosphorescent glow. And, faint though it may be, as compared with what we could wish for, yet with so many of the other lights paling on which in the past humanity has relied, it surely is well to open our eyes as widely as possible to its revelations.

What, then, is death as interpreted by this new philosophy? Not the antagonist of life, not a destroyer who wholly undoes what growth accomplishes; but only one of a larger life's conditions, only a movement one way of a growing universe's mighty heart-beat. Two of the

great principles of evolution, as you well know, are the struggle for existence between different agencies, and the survival of the fittest. Nature has used these in the realm of animals and plants between death and unbroken life; and paradoxical as it sounds, it is literally true that death has survived because in the struggle it has been found the fittest to make animals and plants live. It has come about in this way: among the original protoplasmic cells in which all life began, variation produced some that continued their lives and produced their offspring by simply dividing themselves and never dying; others that continued their lives by differentiating themselves into two kinds without dividing, one of which nourished the other and after reproducing its offspring out of them, itself died. Some of the first kind, dividing and redividing as fast as they grew, have come through all the geologic eons to this day, are the ones, as Weismann has shown that thus far have been immortal. But they have never got beyond their original cell life,—could not, because simply repeating themselves by division they had no extra cells to be used up in ministering to higher vital functions, no chance for variation in their offspring, and nothing in themselves for improved environments to act

upon. They are the amoebic forms which are to be found any summer day in our ditches and pools,—down there that we have to go to find earth's genuine immortals, not to any French academy,—are likewise the world's genuine conservatives, and real unadulterated first families.

On the other hand, the cells which began life with dying are the ones that have forever progressed. Keeping their differentiations together they could organize and use a part of their number up in other functions than those of reproduction. When the parents died, a vast amount of the old habits and conservatisms that were fitted only for an old environment died out of the race with them. With a new set of cells to be built up around the transmitted ones in each generation, there was a chance for variation and the new environment to make improvements. The children to be as good as their parents, had to be better. So life has gone on, mounting with each set of deaths into higher and higher and higher forms, till it has culminated in man. Do you want to see the contrast between the outcomes of the struggle for existence between these two principles, dying and continued living, look at a scientist in his laboratory bending his eyes over

his 80,000 power microscope and the wriggling amoeba in its object glass, that he is using all its powers to see.

It is a process which is still going on in the man. He lives by dying. The reproductive cells out of which he is born remain immortal, but all the somatic ones by which he grows and acts, are with every moment having some of their number used up and replaced by new ones. That is what eating is—filling up the ranks of the little killed cell-soldiers in life's battle with fresh recruits. Love and life have always been known to have a close connection with each other. But how? It is through dying,—the skeleton death the finest who joins their hands and speaks their benediction. The undying cells continue life by division, the dying ones by uniting. The sex relation among animals came into existence side by side with their mortality. Strange and wonderful still is their connection. The thrill of reproduction is the thrill of death. If to love is to live, to love is also equally to die. And in science the real figure of what is called the last enemy is not a skeleton but the blooming cheek and rounded limbs of youth filled with that sex attraction which draws men and maidens together,—cupid's arrows that are death's real darts.

It is a law which holds equally good in social relations and with regard to humanity as a whole. Individuals, institutions, races, religions are but larger cells. The conservatism that would preserve them would keep society forever in its protoplasmic state. It is by their dying that the world increases in its finer life. As Wendell Phillips used to say: "Nature's method of reform is to kill off the old and train up the young." Humanity's march is a funeral march,—one-half of all the stepping stones of progress gravestones, the brightest vista of earth's future that which opens through its tombs. We do well to cover our dead with flowers, well to adorn our cemeteries with lawns and groves and pleasant things, for they symbolize as nothing else can, the ever finer life which is to grow out of them. Personal mortality written out scientifically means social immortality; the burial of the individual the resurrection of the race. It is dead lips that speak the world's better prophecies; the pyramids of Egypt that catch on their peaks with each rising sun a fairer light of man's new day than ever flashed on her thrones.

"My sister sunshine smiled on me,
And of my visage made a shade.

Behold, she cried, the mystery
Of which thou art afraid.
For death is but a tenderness,
A shadow that unclouded love
Hath fashioned in its own excess
Of radiance from above."

But accepting this as the interpretation which evolution gives of death in this world and for the race here, what light, it may be asked, does it throw on it with reference to another world and the individual soul? To find it conducive to a higher life and a blessing on so large a scale is surely something even in this direction —affords at any rate the presumption that what is a beneficence and has an upward trend for the whole, cannot be entirely the opposite in its bearing on the parts. Look first and see what it really does in its dealings with the parts beginning with the humblest ones, even here.

The leaves of the tree unfolding into beauty with the breath of spring, do indeed, with autumn's waning suns, fall withered to the ground, and to the casual glance it seems as if the tree which bore them, had returned, at the year's close, to the exact condition it was in at the year's beginning. But its condition is not the same. Something out of each tiny leaf has gone into the wood of the tree, a bal-

ance over death, as it were, the leaf's little soul,—which is stored up in it as the stock with which to begin its next year's growth.

The tree lives fifty, seventy, a hundred years, and then that too dies. But death even then does not put things all back where they were at the start. The soil beneath it is made the richer by its decaying wood, and its fruit has gone from year to year as the food of beasts and birds and as the seed of other trees, and it is in them that something out of it still lives. These in their turn perish, but their instincts, habits, experience, life,—a subtle essence out of all they have gathered up, is transmitted to their offspring, helping to develop the species, genus, order, to which they belong. Species, genus, order in the long course of ages die out, as in many a "scarpèd cliff and quarried stone" we have the evidence; but it is only to have new ones with an inheritance of what is best in the old ones born in their place—a point where Darwin's theory as to the origin of species supplies grandly what otherwise would be a missing link. And by and by, as the result of all these livings and dyings, man becomes a possibility in nature, man at first, indeed, but little above the brutes, but by a continuance of the same process, the living and dying of in-

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dividuals, tribes, nations, civilizations, religions, each adding something to the stock, man at last in the full splendor of his nineteenth century estate.

All growth repeats thus the growth of a single tree, is itself really the growth of a larger tree, the mighty tree Yggdrasil, as our Scandinavian ancestors called it; all Junes do what Lowell has sung so poetically of a single June,

“Every clod feels a stir of might,
An instinct within it which reaches and towers
And groping blindly above it for light,
Climbs to a soul in grass and flowers,”

and then to a soul in man. And it is in man, individual and social, that the accumulated essence of all these climbings is stored up, in his soul that all of them which is finest and best, freed by their dyings from what was crude and temporary still lives, an immortality, you see, infinitely higher than that of the bare original protoplasmic cells that death has never touched.

But what is to be the final result of this mighty process still going on, what the completed outcome of these myriad accumulations of life over death that the world is getting full of?

For awhile the answer, apparently sanctioned by science, was the unfolding here on earth of a perfect race, living in a perfect world, a real Eden in the future that would more than equal the storied one of the past,

“Every tiger madness muzzled, every serpent passion killed,
Every grim ravine a garden, every blazing desert tilled,”

and then the concentration of all nature’s forces ever after in its preservation.

It is a beautiful conception, the coming indeed here on earth of a kingdom of heaven, an immortality not of ourselves as individuals, but of our race, of all that is best in ourselves and in all past races going on to live in others, the immortality George Eliot has sung so charmingly in her “Choir Invisible.”

But it is an immortality that we now know, as a matter of scientific forecast, can never be realized. The earth will indeed reach in the far future its stage not of perfection, but of betterness, its golden age when all that earth can be, it will be. But it will not remain at that stage forever, any more than the October fruit will always remain on the tree, or the June sun always in the summer sky. The law of death will indeed be carried out then the

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same as it is now,—after ripeness decay, after evolution dissolution. Humanity will become an old man, society a withered flower, civilization a fallen tree, the world a dilapidated house. A time will come when its last child will be born, its last love-word spoken, its last man, sole heir of all its treasures, look over his kingdom, a time when the earth itself shall be a vast tomb without a breath of air to stir its stillness or a falling raindrop to break its peace, a time when this whole material universe, its every sun expired, its every motion made, sink back to that from which it came. And with such a fate before it, evidently we must seek some other answer than that of a continuance here for all that evolution through the ages has accumulated in human souls. What else must it be,—the death of these also, the absorption of them back into Deity, or like a flame the blowing of them out altogether?

It is an answer that in the light of evolution has a meaning of horror to it such as it never did before, one against which man's whole moral nature, one of the choicest products of evolution, instinctively revolts, one which makes the universe a tragedy in comparison with which all the tragedies ever enacted in it, sink into insignificance. Think for a moment of all the enormous cost at which even up to what

it is now, it has been evolved,—of the myriad brutes that toiled on its foundations before the advent of man, and of the myriads since, that have died to furnish it with food; of the savage races that groped their way through the chill and dark of long glacier ages and superstition's nights to civilization's dawn; of the mothers who have travailed in pain to bring forth its children; of the workmen who have wrought in weary mines and fields and factories to heap up its material treasures; of the vast armies that have fought and bled and died in battle agonies to decide its questions; of the horrible sufferings that have come from its accidents; of the thinkers and scholars who have delved and soared, and line by line have sought out its truths; of the singers whose inspired souls have poured out its treasures of poetry and song, and of the martyr throngs who generation after generation have laid down their property, their lives, their all, on its altars of liberty, religion and reform;—and what, with such an ending, is the good, at last, of their life-long toil, what the advantage, when the summing up comes, of the martyr's devotion and the patriot's zeal, what the difference weighed in their final dust between virtue and vice, saint and sinner, Jesus and Judas, a life among the stars and a life among the clods?

"Spring, summer, autumn and winter, and all these revolutions of the earth,
All new, old revolutions of empires,—change of the tides,—what is all of it worth?
What the philosophies, all the sciences, poesy, varying voices of prayer,
All that is noblest, all that is basest, all that is filthy and all that is fair?
What is it all, if we all of us end but in being our own corpse coffins at last,
Swallowed up in vastness, lost in silence, drowned in the deeps of a meaningless past?
What but a murmur of gnats in the room, or a moment's anger of bees in a hive?"

Of course the difference between them is immense as we go along; of course, taken day by day and hour by hour, it is better to do right than wrong, live nobly than live meanly; and with all the world's sorrow and pain, it must from the very start have had a preponderating amount of happiness, otherwise it never would have evolved at all.

But this alone does not satisfy—does not really give any meaning to an evolution which in the end evolves nothing. It takes something more than happiness, more even than virtue's happiness, to make life worth living, takes an object ahead for the virtue to enable virtue to be really happy, or, perhaps, even to exist at all.

A poor tramp, asking of a man something to eat and set by him to wheeling sand from one side of the road to the other and back again, over and over, to earn the food, after trying it a few times rebelled at the task, and asked for something, even though harder, that would be of some use. "Why," asked his employer, "what difference does it make whether you wheel sand back and forth, or dig a well, so long as I pay you for it the same wages?" He could not explain the difference in words, but he felt somehow in his miserable tramp soul that there was a difference, and that a life spent so would be more thoroughly a waste than to stroll along the country roads, doing nothing, or to lie down at once in the desert dust and die. What now is a universe beginning and ending in fire-mist but such a shoveling of its atom sand from one side of eternity to the other, all without final use and having its myriad shovels do it simply to get their meals? And however excellent the meals may be as the workmen go along, having even happiness for one of their viands, who will not say with the tramp, that rather than waste life so, it would have been better to have had its potencies lie down forever undeveloped in their original atom heap?

Directly opposite to this is the answer that

evolution must necessarily give to the question of what is to become of its gains, stored up human souls, when this material universe shall reach its end. To say that they are to end and that out of what held them nothing is to come, is to contradict its own fundamental teaching as displayed everywhere else,—is to make nature after acting for countless years along the line of evoking out of every other death some higher forms either of life, or of life's dwelling, when it comes to the highest and finest thing of all, a universe, reverse its practice, give up its principle. If true to itself, it must say, rather, that as out of the myriad dying things of the past,—seeds, animals, nations, races, civilizations, religions, there have come, as a rule, ever other finer and better things up to mind and soul, so when the encasements of mind and soul, including the world itself, are destroyed, out of their dying, by the same law, there will come something finer and better still, into which their life, their growth, their essence shall go.

What can this finer thing be? Nothing made of matter, for in the final dissolution all material forms must necessarily disappear. What but the spiritual part of the world, the human souls, in which the finer results of evolution are already stored up, leaving the material

universe to be resolved back to its nebulous mist and possibly to be used over and over again, as the elements of our bodies now are, for the evolutions of other and yet other additions to the spirit world, or, as a field is, on which in time's unnumbered larger years for repeated crops of souls to be raised?

It is not an answer that gives us all the particulars that we may wish to know, is not one that is without some very decided limitations in its scope. But it does give us the central truth that we want assurance of and it carries with it, if not directly, yet by implication a warrant for not a few of our great hopes. It will be a better state than our present one, for that is what in the past all evolution has meant. Yet not a new and strange one, for its beginnings are what we have become familiar with here on earth. Its immortality will be individual and personal, for it is in individuals and persons, as the highest outcome of evolution, that what it is constituted of is stored up here; and with no new beings born out of them, as they are in the continuation of life and its qualities in the natural world; with the new birth, as we know it already, the birth of new spiritual faculties in the individual soul,—the only conceivable way of an evolution from earth into the spirit world is through this

world's conscious spiritual beings. And as what is possible for one soul quickened with spiritual life, must be possible for all souls in a like manner quickened, and as we have the evidence on earth that evolution does not wait for the perfecting of the old before starting the new, physical life appearing long before the completion of the physical earth,—the child before the parents' maturity, and the fruit of the tree while the tree itself is yet growing, so it is a legitimate inference that the evolution of spiritual beings into the spirit world should not wait till the far-off ripening of humanity's stock on earth, but should begin with its first dying child.

All honor, then, to the philosophy which gives the world this ray of new light, imperfect though it is, on that old, old way, so dim and to many so dark, which all earth's children sooner or later have to travel. It derives it, as you see, not from a miracle, or from the interference in any way with the common laws of nature, and not by bringing in any new force or principle, but from nature's ordinary working and by supposing it to go right along, using the forces and principles it has been acting on from the starting of its first atom feet, —justifies the poet's words.

"Gone forever! Ever? No—for since our dying
race began
Ever and forever was the leading light of man."

It takes the material world at its darkest place, its myriad dissolutions, and out of its very deaths wrings the lessons of life,—grapples the most terrible weapon of doubt and turns it into a beam of faith. It has a ray of light, also, not for humanity alone, but for all other animal creatures walking with it the same dark way, gives a meaning to their lives, their toils, their deaths such as nothing else ever has, makes the spirit world the outcome, not of human growth alone, but of the whole earth, something to which the lowest monad as well as the loftiest man has contributed a part. For as the best of everything which has ever lived has remained over and helped to make human beings and human conditions and is represented in their lives now, so it will have helped to make all that human beings will ever be, however high they mount, and will be represented in them through all years and all worlds. It gives animals, if not individual immortality, yet the immortality which comes from "the sweet presence of a good diffused and in diffusion ever more intense"; is the scientific endorsement of Tennyson's

hopeful trust, that "not a worm is cloven in vain;" is a side truth from Darwin's maligned "Origin of Species" which lights up religiously what realms of nature's economy as to brute suffering hitherto so awfully dark; and under it Emerson's mystic words as to nature's inner meaning become how literally true.

"Wilt thou not ope thy heart to know
What rainbows teach and sunsets show,
Verdict which accumulates
From lengthened scroll of human fates,
Voice of earth to earth returned,
Prayer of saints that inly burned,—
Saying what is excellent
As God lives is permanent?"

XIV

THE WARRANT FOR PRAYER UNDER EVOLUTION

The problem of prayer, and especially of its petitioning element, is unquestionably one of the most difficult to the modern thinking mind of any in the whole range of theology. There are many persons, not sceptics or sinners, but cordial believers and doers of religion in its other parts, who feel that its praying for divine favors is the mere tradition of a darker age, inconsistent with the larger views of Deity and of the divine economy that men have come to in our time, and is what reverence itself demands should be eliminated alike from private and public worship. Said a respected parishioner to me awhile ago, "I do not see how you as a believer in science and evolution can ask things of God whose giving would be a direct violation of their most fundamental principles; and for one instead of such prayers I wish you would offer for our meditations simply some noble thoughts or lofty aspiration." Its

practice has actually been given up by many liberal thinkers; and there are others, not yet prepared to drop entirely out of their worship what custom has so long endeared, who would compromise the matter by asking simply for spiritual blessings, or by expecting answers to their petitions only in their reflex influence on themselves, or by making their prayers consist wholly of thanksgiving and praise.

But the asking element, though not by any means the whole of prayer, is historically its root and starting point. Whatever else it may unfold into, there are times in every person's life when it becomes the central and all-absorbing thing; emergencies when the soul feels it must have not only communion with God, but the direct help, also, of his everlasting arm; and even to have it exert a beneficial influence on the petitioner himself there must be in it the sincerity which can come only from a belief in its outward efficacy.

It is a matter with regard to which science has indeed hitherto spoken with a most discouraging voice; but science and especially science in its new garb of evolution, has here, the same as in many other places, two voices that are in some respects directly the opposites of each other. It is the most radical and destructive, and also the most conservative

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and protective, of all forms of thought,—tears off ruthlessly the outside of ancient things, but often keeps its grip on their core when everything else, even the most backward-looking philosophy, has given them up, scatters the petals of religion on the ground, as nature is now doing those of the apple tree, but only to unfold beyond them as the apple tree will, the more precious fruit. It seems to me it does so with prayer; and in discussing the subject I want first to set forth the difficulties it puts in the way of its being answered, and then the finer voice with which it tells us, as a part of itself, that it has in a large way always been answered.

Foremost of its difficulties is the modern view of what the universe really is and of how its affairs are carried on. The view under which prayer originated was that of the world as a comparatively small abode consisting of various independent realms, each presided over by its own special deity who conducted its affairs, like a human absolute sovereign, by the direct edicts of his will; and under such a view of it there was of course no inconsistency in a person's asking his god to do for him one thing rather than another, and to favor his own subjects rather than those of a foreign deity. But under our modern scientific view

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the universe consists of a myriad worlds correlated with each other in a vast system whose Deity is one all-pervading spirit conducting its affairs by laws and forces which are inherent in the thing itself; and to ask to have any event in it made different from what it would naturally be, is apparently to ask to have a new force introduced into it and to have all subsequent events in it made different from their natural course, that is, means an alteration in the very constitution of the universe.

Then, assuming the possibility of such answering so far as Deity is concerned, the difficulties are equally great in the way of its being of any real benefit to man. In the mad-dening maze of things who, as a finite being, can know what to pray for as his real good? How true are the words that

“We, ignorant of ourselves,
Beg often for our harms”;

and if, to prevent our being cursed by the granting of our requests, we add at the end of them as we ought, “Thy will and not mine be done,” why should we not rest in its being done at the start? Why be to all the trouble of asking our own will to be done only to wind up with asking it not to be?

But man is not one alone. The world is full

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of diverse and clashing interests, some persons praying for one thing and some for another, and how can all be granted their requests, how any of them without an unfatherly partiality? If the prayer be that he will answer the most deserving, what does it imply but the idea that if he was left to himself he would not do so? Or if Dr. Bushnell's notion be accepted that he goes by the will of the majority, what becomes of the doctrine that prayer is the special resource of the weak and solitary?

Men, in planning their business, need a reasonable assurance as to the regularity and uniformity of nature's laws and forces; but if this regularity and uniformity are liable to be interfered with in some emergency by the granting of prayers, so they cannot be depended upon, how great to the rest of God's children would be the harm. Suppose, for instance, that after the weather office at Washington had made up its indications for the day and telegraphed them all over the country, some humble Christian in Connecticut who wanted rain, or some pious farmer in Massachusetts desiring sunshine, should be able to get his wish granted by kneeling down to "move the arm which moves the world," what would the indications be worth, —what help to the merchant who was planning

to send his ship to sea, or even to the Sunday-school children who were in doubt about starting out on their picnic?

Then as regards the influence of such petitions on the prayer-maker himself,—if always answered, would not the answering as the easiest way of getting things done, almost inevitably slacken his own exertions and in the end make him a mere parasite on Deity; and if answered only occasionally, would not the omissions sooner or later catch him at a time when his expectation of an answer had led him to neglect the precaution he otherwise would have used, so result in a loss that would offset all his gains? A few years ago, while a party of children were playing on the banks of a Western river, one of them fell into its waters and had just lost consciousness, when he was seized and dragged ashore by a noble dog which came bounding along—life was not yet extinct and, if his playmates had been only ordinary unsanctified little boys and girls, they would at once have obeyed the prompting of their natural hearts to rush off to the nearest residence for human help. But they were all nice Sunday-school children taught to look to God for help in emergencies, so they at once knelt around him in prayer to God for his restoration, sentimentally a beautiful sight, but scientifically the worst thing possible, for

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when at last older people came, it was too late to use natural means, and the prayer's answer was a dead child. A similar thing has happened again and again to adult devotees. It was experienced in Montreal, a few years ago, on a terrible scale when its more ignorant Roman Catholic population insisted on trusting to the intercession of their priests to save them from the smallpox, rather than to the skill of physicians; and everywhere the disposition to rely on it is one of the greatest obstacles sanitary science finds in its way.

It needs to be said, also, that the difficulties in the way of prayer are not confined to petitions for material blessings, but are equally strong against those for spiritual good. The unseen world, so far as we know anything about it, is not a separate system of the universe but is under the same reign of law and order, cause and effect, as its visible counterpart. To the larger view it is just as much an interference with the established divine economy to pray for a descent of the spirit as to pray for a descent of rain, just as demoralizing to a man for him to depend on the gift of a revival to get him out of sin as on the gift of health to get him out of disease, or of a miracle to get him out of drowning; and taking these difficulties all together, it is no wonder that

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thoughtful men have been staggered as to the value of supplicatory prayer.

What has science to say on the other side? It begins with saying simply this,—that man is a being not of reason and understanding alone, but of instinct and impulse also, and that prayer, its asking element especially, is one of the great primal instincts of our human nature, one of those things like eating and drinking, laughing and crying, loving and living, to which he is moved, not by any knowledge of their use coming from without, but by an impulse to it coming from within. Men in all ages, all lands, all religions, have prayed. It is not an artificial act imposed on the world by bibles, churches and priests, but a prompting of the soul out of which bibles, churches and priests arose; and though with the progress of civilization and the smooth play of our ordinary life it may seem to be lost, yet in all times of danger and distress, when the depths of our being are thrown open and that deeper subconscious self, which in all of us lies beneath the surface conscious one, asserts itself, it reappears as strong as ever, and man in spite of learning, logic, atheism, sin, breaks forth into prayer.

What does this mean? Until recently it was supposed to have no meaning at all, or, at any rate, as against the deductions of reason and

the understanding, to be only as a feather against the universe, or as the mind of a brute against the mind of a man. But within the last few years science, under the guidance of evolution, has been studying the instincts alike in brutes and in man, and it finds them full of profoundest meaning, finds truths in them equaling all that logic and learning in their farthest bounds have ever reached. Man's conscious faculties, his memory, judgment, reason, imagination, the ones that of old were thought to be so godlike and whose deliverances received such exclusive attention, are now beginning to appear as only the outside of the mind, only as the sunlit peaks of a mountain, as compared with the immensity of the earth out of which they spring and the grandeur of the heavens to which they point. Who has not stood under the glittering skies some clear summer night, and set his eyes wandering and his thoughts leaping and his soul wondering, first among the starry orbs within his sight, then beyond our own galaxy, beyond the farthest nebula, beyond anything the telescope's keen vision or the camera's patient retina has ever reached, into that vastness of space where the flight even of thought grows weary, and not been thrilled with the mystery which in spite of science, —rather all the more through science, there still

is in our physical universe? But under these later investigations we are finding that it is yet more thrilling, more suggestive, more an appeal to wonder and worship to stand on the shore of our own souls and look off beyond sense, beyond reason, beyond memory, beyond any faculty of the mind we are conscious of, into that vast spiritual realm that is a part even of the humblest human being.

The instincts belonging to this realm of the unconscious self are now known to be inherited habits,—faculties as old as our race, some of them as old as life itself. They began as conscious acts needed for food, defense and the keeping of their possessor physically alive. They were done over and over till the prompting to them became fixed in the individual doer, and as such was transmitted to its offspring. Those that kept them up survived as being the fittest; those that failed to keep them up perished in the struggle for existence with no offspring, as being the unfit, and so generation after generation they have come down to our day as the inborn means by which every creature is enabled to live. The wild goose takes its flight north or south with each changing season because it is the descendant of geese which among the many that tried other directions and so were lost, found these to be the

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ones by which to get their requisite food and surroundings, and did it year after year, and flock after flock, till it became a habit fixed in their blood. The newborn babe when hungry or hurt or in danger, cries out for its mother to feed it and save it, because it is the descendant of babes who, ages ago, out in their wilderness home, found such crying to be the surest way of attracting the mother's attention, the ones who did not so cry being the ones who oftenest perished. Why does the man who falls into the water, or into danger of any kind, instinctively cry out for human help, even when no human help is in sight? It is because men in past ages, placed in like circumstances, have found that the cry as a whole, though amid many disappointments, has been of some avail in bringing them assistance. So with their cries to God, even when no God is seen or believed in. They are the voices of the race; and they are uttered—there is and can be no other explanation—because the race amid a myriad disappointments has found that somehow they had a saving power, and because those parts of the race which uttered them the most, are the ones that amid a myriad dangers have pulled through.

The praying which has thus come down to us

as an instinct of the race, is of course based on the old idea of its gaining an outside supernatural help, and as such it has to be held, as I have shown, in direct opposition alike to the science and religion of our day. But now admitting this, the question further arises, is this idea absolutely essential to prayer, or is it possible to drop it so as to harmonize the two things and to still retain its real life? What is the essential thing about prayer to God? Not surely the formal asking of him for a blessing; not the idea of its coming from without nature; not the idea that it must be entirely a gift. It is simply a desire for it directed towards him, wherever he is, and to have it come through him by whatever means. As the familiar hymn expresses it,—

“Prayer is the soul’s sincere desire
Uttered or unexpressed,
The motion of a hidden fire
That trembles in the breast.”

And as Coleridge has said,—

“Ere on my bed my limbs I lay
It hath not been my use to pray
With moving lips or bended knees,
But silently by slow degrees,
My spirit I to love compose
In humble trust my eyelids close

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With reverential resignation,
No wish concerned, no thought expressed,
Only a sense of supplication,
A sense o'er all my soul impressed
That I am weak, yet not unblessed,
Since in me, round me, everywhere
Eternal strength and wisdom are."

And this desire, this inward sense of supplication, is what underneath all its supernaturalism has existed in all ages and all lands as the real heart of prayer, this with all its supernaturalism stripped off that may still remain as strong a light as ever.

The element, however, thus found in it is not only reconcilable with reason and science, but is demanded by them everywhere as one of the most vital elements of all success. Desire, ambition, the earnest craving for a thing "uttered or unexpressed," this is the primal source of all getting, this the thing in the farmer, the mechanic, the artist, the scholar, the Christian, without which labor, acquaintance with the laws and forces of nature, preaching, the faculty of reason, and belief in right, truth and God, are of but little use. A man may be equipped with everything else, a good body, keen senses, a brilliant mind, and a noble soul; but, if he has no desires for anything, no inward heart of prayer for it, nothing will ever be attained.

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It is desire, not in the language of prayer-meetings alone, but of all science, which "moves the arm which moves the world." The whole universe is divided between this element of prayer on the one side, and its answer on the other. Every planet and every atom asks for companionship; every blade of grass for the sunshine, every flower for the dew, every insect for its food, every animal for growth and happiness, every faculty of our being for the means of life; and when man voices his asking in the words of prayer, instead of its being unwarranted by anything which science can find in nature, it is only his part of a grand litany in which every living thing from animalcule to angel, joins, and whose answer God is giving in every thread of gravity, every drop of dew, every ray of sunshine, every throb of love, every word of truth, every resurrection of springtime and every raising him to himself.

But still, it may be said, admitting all this, admitting that the essence of prayer is desire and as such is rational, why not call it desire? Why not cherish and nourish it like all other desires, with its own appropriate food? Why not direct it like all other desires, to its own special objects,—the desire for food to food, the desire of truth to truth, the desire for goodness to what is good? Why call it a prayer

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and direct it to a God? The question is a fair one, is the last link in the chain of a prayer's logic, often, however, left unforged; and is capable, I believe, of a full scientific answer.

How is it that our desires are nourished, strengthened and directed to their appropriate objects? One way is by their use, by the cultivation of those special faculties which lead to them, and by the food for them which exists naturally in those objects themselves. For instance, if a man wants more truth, he turns his desires for it in that direction, cultivates his intellectual faculties, and uses each item of truth which is attained, as the food with which to nourish his desire for more. But this is only a part of the process. Another thing needed is quickening, inspiration, enlightenment, and the enlarging, refining and uplifting of the whole soul. We know how it is with the mind, know how much brighter, quicker, more eager for truth, and more capable of its discernment it is at one time than at others. Why? Not because the mind itself is changed either as to its desires or faculties; but because it is inspired, touched somehow by an influence from the outside which is breathed into itself. So with all our faculties, even down to our muscles and nerves; their strength and capacity depend not

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on themselves alone, but on something which operates upon them from without, almost as much as the organ's music does on the bellows' breath. What is the source of this quickening? What but that great Divine Spirit which is all around us, in matter, in nature, in food, in love, in truth, in everything, that wonderful something whose existence no science can deny, which is recognized by Spencer and Darwin as much as Jesus and Paul, and in which philosophy and religion alike say we live and move and have our being, that breath which makes the great organ of the universe alive with music, and that radiance which is

"The master light of all our seeing
The fountain light of all our day."

And how are we to draw it from this great fountain and make it available for our individual enlightenment and inspiration? How consciously, but through prayer? We know how it is with the illuminating gas of our cities. Out from its great reservoir there is a network of pipes going to every house, some larger and some smaller, some clear and some choked with dust, and ample pressure to send it into every cellar and attic as well as every parlor. But this alone is not enough. To have it illumine, the stop-cock at the end of the pipe must be turned and the

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match applied. And all this is voluntary. The citizen can live without it, grope around with a taper, or by the aid of his other senses do some things in the dark. But when the stop is turned and the match applied, what an inspiration it is! How much better he can see to work, to eat, to read, to play, to do everything! And to use it thus who will say it is a mere superstition? Who that we might as well direct our desire for light at once to the light, rather than use the network of gas pipes? Who say that the whole thing is not a grand outcome of true science? So with prayer. There is a spiritual network of communion between our souls and the great illuminating Light of the universe, something which runs to every race and every man; and prayer is the stop-cock with which to turn it on. We can live without it, can gratify many of our desires by directing them right to food, love, truth and goodness themselves, can grope around with our ordinary senses and do some work. But to turn on the divine light, to have our whole being filled with its radiance,—who cannot see how philosophical it is that it should help us the better to eat, read, work, play, do everything? Who not see that desire expressed in this way may be certainly not less effective than that which goes for them directly, in securing }

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us food, truth, love and goodness, all, too, in perfect harmony with the laws alike of material and human nature?

Or take another analogy, that of air. It is not muscle or nerve or brain or bone or soul or any part of man himself. It cannot be used directly to run with, or read with, or see with, or work with, or love with; and though it is all around us, a person ignorant of its real properties, who wished for help in his pursuits, might well sneer at its value. But we all of us know practically that it is to us the very breath of life; that muscle, nerve, bone, brain, everything depend on it for their efficiency; that, if a man desires to run, read, see, work, love or do anything, he must first of all desire air; and that though the lowest animals, the amœba, rhizopod and sponge, and even the embryo child, may exist without any lungs for it, yet that they are developed and increase just as we go up the scale of being, and that they reach their full evolution only in perfect man. So with prayer. It is indeed "the Christian's vital breath"; is the process by which the soul takes in the spiritual atmosphere that is all around it. The inspiration it gives is felt in our study, work, amusement, everything we do, giving an answer to our desires for them so, as no direct reaching out of our faculties to them could.

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And though a man may get along without it to some extent, it is only as the rhizopod and sponge, without breathing, and, as we mount up into science and civilization, we shall evolve not out of it, but like the physical man, into its larger, deeper, fuller use.

And now, friends, have I not given you a good, honest, rational and scientific justification of prayer, recognized all its difficulties and incongruities, but met them with laws and facts on the other side that are equally solid and insurmountable, shown that the only thing needed to make it harmonize with the evolution of the outward world is the parallel evolutions of its own intrinsic meaning, and found a place for it alike in our deepest instincts and our loftiest and broadest philosophy? It is thus, as I understand, which is in the true line of evolution, not to root up and tear out and throw away the old growths of the world anywhere, but to throw off their old husks, unfold them into richer and diviner meanings, and reap from them new blossoms and new fruit. And, meeting together from Sunday to Sunday, as progressives, liberals and evolutionists, instead of relaxing or giving up prayer, shall we not on this very ground, lift up our common wants all the more to him who is the God alike of science and Scripture, and who, as one result of this

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very evolution, has enabled us to proclaim "Thy servant, Lord, hath found it in his heart to pray."

"For what are men better than sheep or goats
That nourish a blind life within the brain,
If having hands they lift them not in prayer
Both for themselves and those who call them
friends,
For so the whole round earth is every way
Bound by gold chains about the feet of God."

And the instinct in the human soul which prompts it with life's changing seasons to take its flight in the direction of the spirit world, and in God's child, when hungry or hurt or in danger, to cry out to him for help, must have had a similar origin. Men pray because they are the descendants of ancestors who somehow found praying a help to them in keeping alive, they being the ones naturally who would have children to transmit it to, so that at last it became fixed in their race, while the ones who did not use this means of help would be the ones naturally to die out and to leave no descendants. There is no other way of accounting for its origin, and this does account for it perfectly. It is what the doctrine of natural selection and survival of the fittest means, the survival not only of species, but of habits, forms, faculties,

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morals, tastes, religions, everything in him which has been of use for safety and sustenance. Its survival is the best possible proof that it has been of such use. And to apply it to prayer is not forcing its meaning, not making an argument of it which is unnatural and far-fetched, but is simply coördinating it with its use in relation to all the rest of our nature and all through the organic world.

What though its help in continuing life, as compared with that of the strong muscle and the active brain, may have been small. Nature is full of instances, as Darwin has pointed out, where other things as slight as this, an extra feather in the wing, or finer color in the feather, a sweeter tone in the voice, an upward look in the eye—have proved the very additions needed to enable their possessors to come off as victors over their competitors in the struggle for existence,—shows us the lily and the dove as survivors of the paleoron and the pterodactyle, shows us even in human history, Greek swords edged with patriot love, and Cromwellian soldiers weaponed with a psalm, as more than a match for Persian hosts and royal guns; and it well may have been that the white wing of prayer, the gentle tone of entreaty, the upward look of supplication, devotion's lily and re-

ligion's dove, have proved of like help in securing a like survival in the case of man.

It is this, as it seems to me, that is the deeper, sweeter, more trustworthy voice of science with regard to prayer. It does not directly refute the objections that are urged against it by its other voice, does not present special instances here and there of its being answered, but it goes back of them all and shows the whole human race as a proof of its value, shows not by a long chain of reasoning but by a logic which has only one link, the shortest, perhaps, in all the realm of dialectics, that the best proof of its being answered is its being asked. Talk of giving it up now as passed, and as having no standing place in science! Why science has only just reached out to the realm where its roots really are, has just become large enough itself to afford it room. It finds its seat to be in the oldest part of our nature, in that which goes down through all the strata of conscious life to its primal fires, not likely, therefore, to be blown away by any surface storms. With Emerson it says,—

"The litanies of nations came
Like the volcano's tongue of flame
Up from the burning core below,—
The canticles of love and woe."

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And whatever may be the difficulties of the mind and the understanding as to its answers, it would have us keep up its practice for the very reason given in the old Scripture words that I have taken as a text, because "Thy servant Lord hath found in his heart to pray."

XV

THE NEW MEANING AND POSITION OF WORK UNDER EVOLUTION

Doubts about prayer are strongly felt in our day, but the problem of work, so often set up as the easy alternative of prayer, is one which to a vast number of people in our time is infinitely greater and more perplexing, and more in need of light. The difficulties connected with prayer are in regard to its relations with the material order of the universe, how to adjust it to the reign of law, to the idea of God as a perfect Creator, and to the growth and use of man's scientific and rational powers, and are largely theoretical. The difficulties connected with work are in regard to its relations with the world's moral economy, how to adjust to the reign of love, to the idea of God as a considerate Father, and to the growth and use of man's moral and spiritual faculties, and are intensely practical. Whether or not to pray is a matter of free choice, is what comes up for decision only now and then in some quiet hour

of meditation or some rare emergency of peril, and is often only a question of pleasant curiosity. Whether or not to work is a matter where the choice is necessity; is what has to be answered afresh every day and every hour, and is a question of life or death. A person may be an infidel with regard to prayer, may never bend the knee at home for its blessings, or join with others at church in asking for its objects, and his penalty is only the loss of some spiritual good now, or the threat of some physical woe in the far-off future; but let him be an unbeliever with regard to work, refuse to bend his back to it in solitude, or ask for it with others in society, and instantly its penalty comes in hunger, suffering and death. And where there is one man or woman who is wrestling with the knotty points of prayer as a means of obtaining good, there are millions who are being crushed in their struggle with work as a means of getting from God the things they need. It is no wonder that a friend said to me: "What the most of us in the Christian Church and every other want to drop is not our prayers, but our work; what we want justified by religion, not so much our litanies as our labors." Is there any light which modern science can bring to bear on this problem, any new philosophy which better than the old ones can help us to solve its

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meaning and to bear its burdens? It is a question whose religious significance no one can deny. And so, what I did last Sunday for prayer I want now to do for work, discuss it in the light of reason and from the standpoint of evolution.

We all know the explanation which the old Hebrew Scriptures and the theologies based upon them, give of work. It is the penalty of sin, is the result of the curse pronounced on our first parents because they had eaten of the tree of knowledge in the Garden of Eden. It is an idea which theoretically has been given up. Labor is proclaimed to be a blessing rather than a curse. The world is full of sentimental orations on its dignity and divinity. The garlands of poetry have been wreathed around it; and it has been advocated as the true form of prayer, "Orare est laborare." Yet by myriads of God's creatures it is still practically regarded as a curse. Its associations are those of drudgery, dirt and disagreeableness. It takes them away from the playground, the restful couch and the atmosphere of freedom, and gives them the rough field, the dark factory, the narrow counting-room and the tumultuous sea. Hard task-masters, soulless corporations and the loud voice of arbitrary command are its embodiments; and it leaves them with

aching muscles, sensibilities dulled to poetry, beauty, truth and all the high things of the world, and with a pittance of mercenary coin. Is it any wonder that they fail to see in it a blessing; any wonder that the reasons against it from the moral standpoint seem to them even stronger than those against prayer from the standpoint of nature? A lady of my acquaintance who had been very much impressed with the fact that her horse was a great deal more eager and spirited in getting back to his stable than in going from it, and who thought that after standing still all night and perhaps for days he ought to be glad of the chance to exercise himself in a little carriage-pulling, asked the hostler one day whether they all of them had this reluctance to labor, or whether it was a peculiarity of her beast. "Well," said he, with the Yankee art of putting things in the aptest way, "they don't none of them go out laughing when they are hitched up." So with us human beasts of burden; it matters not how sentimentally we may talk about work, and how delightful it ought to be to engage in it, when the harness is actually put on, we don't any of us go out "laughing" to its wagon-pulling. And yet with one part of our nature regarding it as a curse and set so strongly against it, it is to be recognized here the same as with regard

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to prayer, that there is another part of us which instinctively regards it as a blessing, and which in all ages, the same as with prayer, has drawn us towards it. Man is naturally a working animal. Mingled with the strong leash of necessity which is ever driving him unwilling to his toil, is the gentler cord of love for it, which is ever leading him gladly to its burdens. One of the chief things which distinguishes him from the brutes is the fact that over and above getting enough to satisfy his wants at their present standpoint, he has a little bit of something in his nature which prompts him to put forth an extra blow or two, for other wants not yet wholly developed. It is on this residuum of the attractive over the repulsive in work stored up within, that is built all our wealth, all our civilization, all our progress, this that is the source of that much abused thing, capital. If labor was wholly or preponderatingly a curse, if it did not have a balance of blessing on its side, it would be impossible to account for the habit of it in our race, any more than for that of prayer, or indeed for the race itself. The working members of the human family have survived and have transmitted their instinct for it to their descendants, over the non-working ones, on precisely the same principle as that on which the praying members have survived and

transmitted theirs, the principle that it is the fittest, that is, that it gave them an advantage in the struggle for life over those who worked less, or not at all. And the burdens, the drudgeries and the injustices of labor, the things connected with it which apparently drag men down, blunt their sensibilities to higher things and rank them with the brutes, are an argument against its blessedness only in the same way, and to the same extent, that the superstitions and falsities connected with prayer are an argument against that,—to the extent of its outside drapery and to that alone.

Admitting now in this general way that labor cannot be a penalty and a curse, any more than prayer, or any other instinct can a folly and superstition, we want next to get at its positive side, to learn its place and meaning and what it is for in the economy of nature, and to ask how it can be freed from its darker features.

Its object, as commonly understood, is to get its doer the means of life,—food, clothing and shelter first, and then after these, amusement, beauty, truth, religion, all those which go to supply his higher nature. Man, and not man alone, but all other creatures, animal and vegetable, are beings endowed with wants, beings that, unlike inanimate things, cannot exist by virtue of what is in themselves alone, but are

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obliged to reach out for other things on which to live, the lowest for bare soil, air and light, and each above these in larger and larger circles, and for finer and finer things, till we come to man reaching out for his through all worlds and up to all heights. It is around these wants, these appetites, aspirations and desires, and with reference to their supply, that all the rest of our organization, our limbs, senses, instincts, intellectual faculties and spiritual powers, are built up; these which explain why the flower has its petals, the tree its roots, the insect its feet, the bird its wings, the tiger his claws and man his hands, his eyes, his reason and his soul. They are not shaped by chance or with reference to some preconceived ideal, but only as the best practical apparatus to supply wants; and it is their use for this purpose which constitutes work,—this which gives us philosophically its meaning and place in the order of nature. Instead of its being an after-thought of the Creator, a penalty of sin suggested to him by man's disobedience, it is a primitive and fundamental principle of the animate world, entering into its very plan. To live is to labor; to have faculties and powers, to work. And instead of its being an ugly, clumsy thing, the doing ourselves because nature had no skill to do for us, there is nothing

in all its round which is more ingenious and beautiful than the machinery of which it is a part. On the one side are wants, on the other the things wanted. The only way in which there can be life is by having the one get the other. The only way in which this getting be done, by the creation and use of various faculties and powers; and the getting itself,—this is work. Wants are the engine that moves the world; its movement is labor, and its result, reaching the means of life.

But this is only the near, immediate object of labor. The question now comes, What is the object of this object? What the result that is sought for by our having and using the means of life? To gratify wants alone, and these so largely the wants of food and drink, even with living as their outcome, would be a very meager reason, if this were the whole, for all the hardship, pain, weariness and wear that work everywhere involves. The things labored for, the meat and drink, the clothing, the houses, the books, the nationalities, the civilizations and even the religions, that are reached with such toils, groans and tears, perish in the using, die in making live; and the animals, the men and the races which use them, in a little while longer they perish, too; and then the whole thing, all the round of labor has to be gone through with

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again to supply a new set of creatures destined in their turn likewise to perish. It seems outwardly a realization of the old classic stories of Sisyphus rolling forever the stone up the hill, only to have it roll down again, and Tantalus forever pouring water into sieves that immediately let it out again. And it is this apparent uselessness of labor that is the hardest of all its burdens, this which makes the question of whether it has any ulterior object beyond that of mere present living, one of tremendous practical importance.

It is a question to which evolution gives a complete and triumphant answer. It shows first, that the object of labor beyond the building up of the individual, is the building up of the race. The thing labored for does indeed perish in its use, but in perishing it feeds the laborer, gives him more strength and larger wants, which in their turn labor for other things; and thus the process goes on back and forth, the labor itself aiding in the growth till the individual reaches his completeness; and then, though he dies, there is a subtle essence out of his growth which goes into his stock like that of the leaves into a tree, making that the larger and richer, and his offspring the more capable; and so on from generation to generation and from age to age. We have

in our blood to-day the labors of the first man, yea, and of the first animal, that ever toiled; our strength, our capacity for labor, our humanity, is a fruit to which all the myriads before us who have ever delved with muscle, mind and soul have contributed each a part; and when the perfect man stands on earth, it will be on the shoulders, through all the ages, of all the earth's toil.

Nor is this all. The growing man must have a growing environment, must have this evolved side by side with himself. It is a work which nature does in part, her forces and her laws which toil on its outward structure, giving us, age after age, richer soils, fairer skies and more harmonious elements. But, beyond these, society, government, letters, science, and religion, all that goes to make civilization is needed; and it is this finer environment that man's work helps to build up. Its immediate products, houses, temples, furniture, books, paintings, statues, and the special forms of government, science and religion do indeed perish with their use, equally with our food and drink; but out of them a subtle essence like that from our food, remains and goes to nourish the great structure of society and of the universe. The stone of Sisyphus never rolls back quite to the foot of the hill; the waters

of Tantalus never leak wholly out of the sieve. The civilization of to-day is the result of its long rolling and pouring; and when it is complete, when a perfect world shall be the environment of a perfect humanity, in it will be the labor, eternal as itself, of every man who has ever dug a sod, driven a nail or thought a truth.

And is evolution here the end of labor? With a perfect humanity and a perfect world accomplished by it, is it then to come to a stand, then to see this mightier structure perish? No; the same principle which demands an object for labor beyond the life of the individual, demands an object for it beyond the life of nature and the race. What can this be but the growth out of them of a spirit world, of spiritual beings and of endless progress? The labors of time, not the immaterial ones alone, but the humblest ones of the muscle and the limb, are to reach over into eternity. Mingled with their stains of filth and dirt are the glitter of spiritual splendors; and rooted in the noisy factory and the darksome mine they are to blossom and fruit in the music of angel choirs and the light of the everlasting day.

Who now will say that under evolution, work as well as prayer does not have a meaning and position such as even under poetry and religion

it never did before? The old theology made the world a prison in which work was inflicted as a punishment. Political economy makes it a factory where it is paid for on the wage system of so much meat and drink. But under this new philosophy it becomes a great co-operative establishment where every man, woman and child is a part owner and has his proportionate share of the proceeds. And who does not know the new zest which is given to toil when the toiler feels that its object is his own? Where is the carpenter who does not enjoy building a house when he himself is to have it and live in it, as he never does when his toil on it is to be paid for in money; where the sailor who does not work with tenfold zeal and fidelity in rigging the ship that he has a share in, and which is to bear himself and his dear ones over the seas? And this great house of humanity, to feel that it is to be ours to live in through all ages; and this great world-ship, to know that it is ours to sail in over all the seas of time and into celestial ports,—is there anything which can so make us forget the bruises and stains and drudgery of their building, and fill us with enthusiasm and fidelity to make it good?

It is a principle which at last is to solve the problem of work in all its minor fields. The

